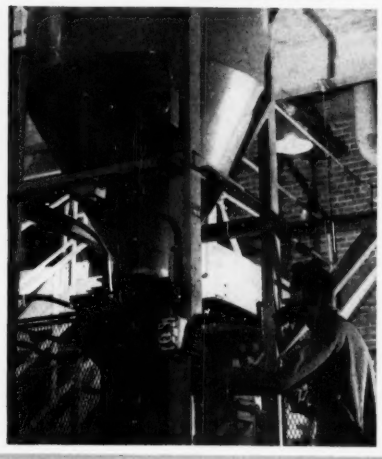
Chemical Week

November 3, 1951 Price 35 cents



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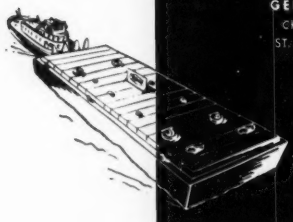


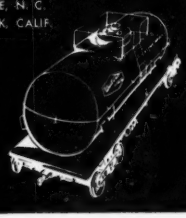

Chemical Week

Volume 69 Number 18
November 3, 1951

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OPINION . . . . . .

Hassle Hassle

To The Editor: . . . That was an interesting and very informative news story that you published on the proposal made by Colchem Corp. to build a plant to hydrogenate coal ("Colchem Hassle," Oct. 20) . . .

But you have me bewildered. What's a "hassle"? I've searched for the word in three dictionaries . . . and haven't found it. Do you have more or bigger dictionaries than I (and our neighborhood library) have . . . or are you just making up words?

Robert T. Stewart
Milwaukee, Wisc.

No bigger and better dictionaries here, Reader Stewart, nor are we coining words. CW is guilty, though, of using a New York localism which means, roughly, a wrangling debate, violent argument. Neatly it combines the thoughts of harangue and "wrassle."—Ed.

Interesting Crystal

To The Editor: . . . With reference to your news article on synthetic crystals ("Better than Prospecting", Sept. 1) . . . it may be of interest to you and others to know that we have been synthesizing and selling cesium bromide crystals since last year . . . for use in infra-red instrumentation.

This is an interesting crystal having the widest range of optical transmission of any material we know of. It transmits from 200 millimicrons to over 40 microns . . .

Mark Hyman, jr.
President
Pilot Chemicals, Inc.
Waltham, Mass.

Right, Reader Hyman, Cesium bromide (also made by Harshaw Chemical) does look interesting, particularly as a replacement for thallium bromide-iodide. Some advantages: It transmits deeper into the infra-red, has lower reflection losses, is less toxic.—Ed.

A Mighty Task

To The Editor: Thanks for reporting the facts and not making a "scare" story out of your article "Better Growth with Arsenicals" (Oct. 6). . . .

You state that the recommended level of the arsenical for stimulating growth of hogs is 0.00675%. This is an error, one easy to make when taking notes . . . the recommended level of 3-nitro-4-hydroxy-phenyl arsonic acid (hereinafter called 3-Nitro) is 0.00375%, 37.5 p.p.m., of the total ration. This means that 1 pound of 3-Nitro will treat 13.3 tons of hog feed. The following additional facts may be of interest:

In the early 1940's research work . . . here at Dr. Salsbury's Laboratories was directed toward finding a chemotherapeutic agent effective for preventing acute coccidiosis of chickens. 3-Nitro was found to be a particularly effective coccidiostatic agent.

Before the compound could be marketed, a new drug application had to be filed with and made "effective" by the Food and Drug Administration. To satisfy the requirements of safety . . . 3-Nitro was administered . . . at various levels to large groups of chickens and turkeys in long-term growth experiments. It was discovered that birds receiving low levels of 3-Nitro gained more weight—statistically highly significant—than birds in untreated control groups. . . . After extensive field trials and controlled experiments involving over 50,000 birds were completed, sufficient evidence . . . was accumulated to satisfy FDA officials that 3-Nitro, at the recommended feed level of between 50 p.p.m. and 90 p.p.m., is safe and effective for stimulating growth and inducing earlier maturity, earlier egg production, better feathering and better pigmentation of chickens and turkeys.

With an "effective" New Drug Application, we first marketed 3-Nitro for poultry in 1944, thus making available the first "growth promotant."

Many other aromatic and aliphatic arsonic acid derivatives have been tested here, but no derivative has been found which equals the performance of 3-Nitro.

Research work which demonstrated that 3-Nitro is safe and effective for stimulating the growth of hogs was begun in 1948 at the University of Minnesota's Hormel Institute. . . .

When a compound of arsenic is ingested, the arsenic builds up principally in the liver. (The arsenic concentration of muscle tissue does not increase appreciably.) The livers of normal chickens and pigs having no access to compounds of arsenic will contain the equivalent of from 0.1 to 0.5 microgram of As_2O_3 per gram of fresh tissue. The livers of chickens and pigs fed 3-Nitro at the recommended level . . . will contain the equivalent of about 1.0 microgram of As_2O_3 per gram of fresh tissue.

The U.S. Dispensatory gives 3.0 milligrams of As_2O_3 per day as a therapeutic dose. Therefore, one would have to eat 6.5 pounds of liver to obtain the equivalent of a thera-

peutic dose of As_2O_3. Many times this amount of liver would have to be eaten to obtain the equivalent of a toxic dose—a humanly impossible feat, even if one were a pig.

Two to three days after 3-Nitro is withdrawn from the diet, the arsenic content of the liver returns to normal value. At the suggestion of FDA officials, the label on products containing 3-Nitro states, "Discontinue use of this product 5 days before slaughtering for human consumption."

The foregoing illustrates the enormous amount of research work which must be successfully completed before a meritorious product can be introduced into interstate commerce, if it has anything to do with food for human consumption.

FDA officials have done a remarkably good job in protecting the public, but to satisfy their requirements is a mighty task.

T. W. Zbornik
Manager, Research Division
Dr. Salsbury's Laboratories
Charles City, Iowa

Target: Fungi

To The Editor: Your article "Military Target: Fungi" (Oct. 20) contained two statements on which we would like to comment.

On the credit side of copper 8-quinolinolate you cite its slight solubility in most common solvents. Since the use of a solid fungicide is distinctly limited, this was rightfully considered a debit by the trade.

Not until our company succeeded in solubilizing copper 8-quinolinolate (U. S. patents 2,561,379 and 2,561,380) . . . marketed under the name of Cunilate . . . has the slight solubility of copper 8-quinolinolate ceased to be a hindrance.

May we also state that copper 8-quinolinolate is no longer in short supply. New sources of raw material and increased manufacturing facilities have brought about a sharp change in the picture.

With these two corrections, your excellent article will be brought up to date.

Otto Eisenschiml
Chairman of the Board
Scientific Oil Compounding Co. Inc.
Chicago, Ill.

To The Editor: Our compliments on your article "Military Target: Fungi" . . . You have done an excellent job summarizing methods and materials used to combat fungus deterioration of military products.

You called attention to the fact that copper 8-quinolinolate is the preferred fungicide for many military applications, but that this chemical is in short supply.

As a basic manufacturer of copper 8-quinolinolate, we should like to point out, although this material was critically short until recently, the total production capacity . . . has been expanded to the point where it appears that sufficient is available to meet all foreseeable requirements.

L. W. Sessions
Organic Chemicals Division
Monsanto Chemical Co.
St. Louis, Mo.

Certificate Correction

To The Editor: In your Newsletter, Oct. 13, Food Machinery is listed as having received a certificate of necessity for petroleum hydrocarbons.

This organization has received no certificate for such purpose and, in fact, has not applied for one. It will be appreciated if you will correct the statement . . . since the notice has caused us a considerable amount of embarrassment.

W. R. Philbrook
Industrial Relations Director
Westvaco Chemical Division,
Food Machinery & Chemical Corp.,
New York, N. Y.

CW is glad to help Westvaco correct an error made by the government in the compilation of new certificates of necessity. It was from this official source that we obtained our report.—Ed.

Atomic Awareness

To The Editor: I was delighted to see your discussion (Oct. 20) of Chicago's plan to study the public health aspects of radioactive isotope use in industry, hospitals, and other civilian activities.

Those working directly in the nuclear physics field are . . . aware of the problems, but I have seen little . . . published elsewhere focusing attention of public health officials on this new problem they must face. Congratulations are due you for your timely awareness.

T. R. Ochsner
Knoxville, Tenn.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 18, N. Y.

PRODUCT CONTROL THROUGH *INFRARED ANALYSIS*

Number 3 *of a Series of Data Sheets for Better Process Control from The Perkin-Elmer Corporation, Norwalk, Conn., Manufacturers of Infrared Spectrometers, Flame Photometers and Electro-optical Instruments.*

PROBLEM:

1) Raw material selection and control;
2) Control of finished graphic arts products.

PLANT:

A. B. Dick Company, Niles, Illinois.

SOLUTION:

Infrared analyses on raw materials and finished products for:

a) presence of aldehyde impurity in alcohol (shown in few minutes at 5.8 micron band)
b) differentiation between technical and 99% grades of ethyl acetate (by intensity of hydroxyl absorption band)
c) identification of oils on purchased oiled papers (IR analysis saves 2 days time)
d) composition of plasticizers in sheet plastics
e) composition of paper coatings
f) identification of natural waxes (reference spectra used for d, e, f, g)
g) quality control of finished inks and stencil sheet coatings (See Fig. 1)

DISCUSSION:

Most infrared controls completed in 2 minutes compared with 2 days for classical methods.

INSTRUMENTATION:

Commercial infrared spectrometer and standard accessories.

REFERENCE:

Anal. Chem., 23, 4, 1951.

CONCLUSIONS:

Infrared analysis on a variety of complex raw materials and finished products proves timesaving and accurate.

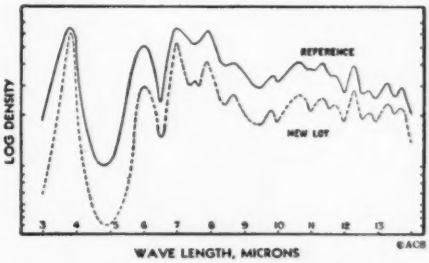

Fig. 1—Infrared Spectra for Process Control of an Ink.

Fig. 2—Product Control with Perkin-Elmer Spectrometer at A. B. Dick Co.

chromates are working on the railroad

In the modern diesel locomotives as well as the sleek streamlined passenger trains, chromium chemicals play an important role.

Millions of pounds of chromates and bichromates will be used this year as corrosion inhibitors in diesel cooling systems. This protection is essential for continued operation of the railroads. In other parts of the locomotive, hard chromium plating increases the life of cylinder liners and bearing surfaces, thereby contributing to the greatly increased mileage which a diesel locomotive can operate without shop service.

Passenger equipment today makes frequent use of chromium plating for tarnish-free decoration and resistance to wear, while in air conditioning equipment chromates again are the most effective corrosion inhibitors.

In maintenance of the right of way, chromates are used for preserving wooden poles, cross arms, bridges, platforms and railings, furnishing protection against rot and termites, while providing a surface which is clean and may be painted. Freight cars also have a longer life due to the value of chromates as wood preservatives.

Still other applications, which are under study and test, indicate that the railroads, like many other important industries, are finding in chromium chemicals a new source of economies in operation and maintenance.

Write to our Research and Development Department for further information regarding chromium chemicals.

Sodium Bichromate

•

Potassium Bichromate

•

Sodium Chromate

•

Chromic Acid

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NEWSLETTER

"Nearer than you think" was CW's assessment (Newsletter, Oct. 20) of coal hydrogenation on a commercial scale.

Now Defense Production Administration has granted a certificate of necessity to Union Carbide and Carbon on an $11 million commercial pilot plant at Institute, W. V. Capacity will be 300 tons a day.

Construction of this privately financed plant will likely scuttle plans for similar facilities under Government subsidy.

Free technology from the Atomic Energy Commission: The AEC is offering 25 patents on non-exclusive, royalty-free licenses.

They cover preparation of fluorine, beryllium nitride, zirconium, hafnium, fluorinated organics, uranium pentafluoride, unarium carbide and radioactive iron. Others describe uranium ore recovery and various pieces of apparatus.

The chemical industry set up a howl when it learned about provisions of the proposed sulfur order, which is schedulded to take effect this month (CW, October 27). These four drew heaviest fire:

- NPA's proposal to enforce limitations on a plant-to-plant basis. Industry wants company-wide control.
- Proposal to limit use on a monthly basis. Industry wants quarterly-or-longer allocations.
- Establishment of a 25-day inventory. Industry fears it can't control deliveries accurately enough, may find itself with extra-legal supplies from time to time.
- Permission to use "captive" production only up to 50% of a firm's allocation of native sulfur. Companies want to save for their own use all the sulfur they recover.

Like sulfur, steel is another perennial problem. NPA says the chemical industry will likely get more structural steel in the first quarter of 1952 than during the current period.

But it will still fall far short of what the industry would like to get. NPA will have to screen the "gets" from the "non-gets."

Chemical firms filed 700 applications for controlled materials during the current quarter. Of 56,000 tons of steel requested, they got only half. Those that got will get—to complete projects under way.

Steel will be easier, but copper and aluminum will still be bottlenecks next year.

Texas' natural gas tax is raising plenty of squawks. Dow Chemical ponied up $15,833 without protest for gas piped to its plants in September. Many small taxpayers also paid quietly.

But most of the big interstate pipe lines paid under protest, laying the basis for a court test on the law's constitutionality.

One swallow doesn't make a summer—but here's a cheering note on manpower. New York University's College of Engineering reported a 6.6% increase in the number of graduate students this fall.

NEWSLETTER

The pall of confusion that hangs over pricing was not dispelled by Congressional action.

As a result, the Office of Price Stabilization is now dusting off CPR-22X and other manufacturers' orders which were promulgated when the Capehart amendment was tacked on the Defense Production Act—but later sidetracked when the Administration's counter-amendments looked like a sure thing.

Likelihood is that OPS will go ahead with the OPS orders on an interim basis, will push for dollars-and-cents ceilings to replace them.

Resounding declarations cover up a lot of OPS confusion, but sometimes the confusion is loud enough to cut through the noise:

Up to now almost every pricing order has been preceded by a declaration that control is necessary for national defense—but last week OPS decontrolled cobalt oxide sales for exactly the same reason.

OPS's explanation: There's an extreme shortage of the material, and exemption from control is necessary to avoid any interference with the flow of imports—in the interest of national defense.

Defense Production Administration also bumped its head against an anomaly last week—the inflationary effect of rapid amortization on government contracts.

DPA Administrator Fleischmann sat down with a top-level advisory committee to assess the effects, recommend what proportion of amortization is appropriate to allow as a cost in the negotiation of government contracts.

The Renegotiation Act of 1950 provides that items allowed as amortization deductions for tax purposes are also allowable as costs in contract renegotiations. The rub is that rapid write-offs are hiking the cost to the government on many procurement commodities.

Congressman Delaney and his committee members aren't loafing in front of the fire during the Congressional recess.

This month they're taking their chemicals-in-food hearings to the West Coast—Spokane, Nov. 13; Seattle, Nov. 17; San Francisco, Nov. 20-21; and Los Angeles, Nov. 23-24.

They'll concern themselves mainly with fruit-growing and canning, visit orchards, farms and canneries to get first-hand knowledge.

You can expect Delaney hearings soon on cosmetics. Congress last month authorized addition of cosmetics to the committee's field of inquiry, and qualified witnesses are now being lined up.

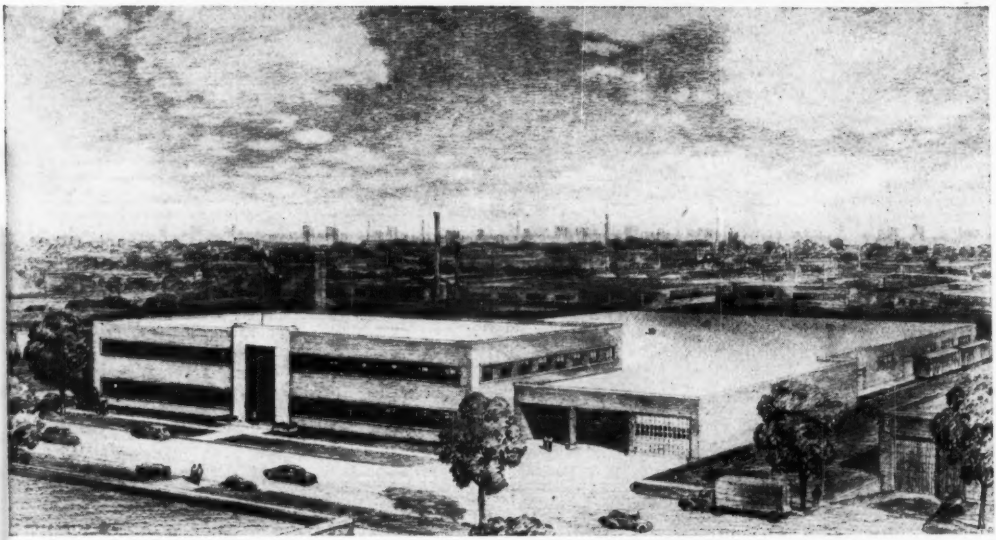
General Dyestuffs Corp. is still firmly in the Attorney General's grasp. Senator Connally's measure (CW, Oct. 27), which would have opende the courts to the former owners, failed to pass.

Scratch the African Gold Coast as a strategic area for U.S. defense —at least as a supplier of high-grade manganese dioxide. The Army Signal Corps has developed a new battery using domestic ore.

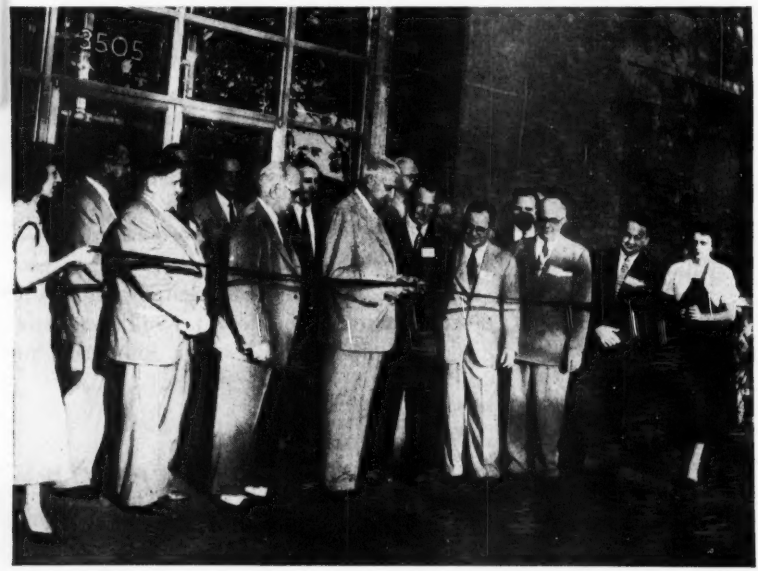
"Road dusting" with calcium chloride by airplane is the latest chemical technique to combat ice on highways. A small test in Ohio last winter was promising, more extensive trials are planned for the coming season.

. . . The Editors

Life ...on the

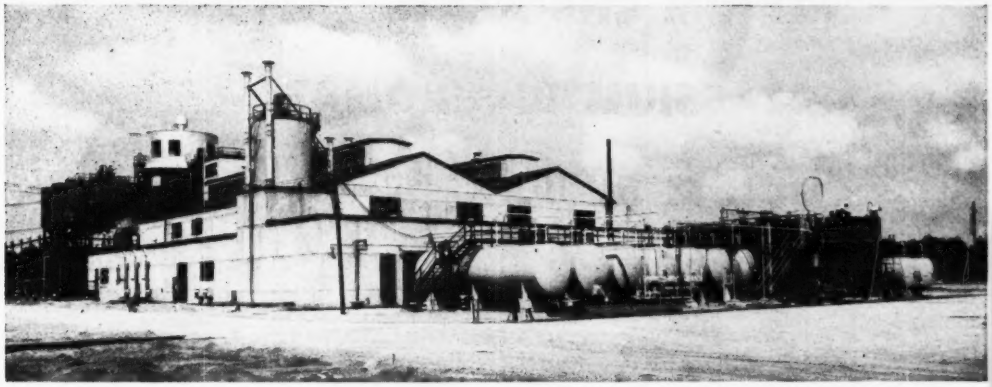


TO BETTER SERVE ITS CUSTOMERS, American Cyanamid has consolidated its divisional Chicago offices and warehouses into this one modern building located in the Addison Kimball District of the city. This consolidation is part of an overall plan to give quicker, better service to customers in major cities of the United States and Canada. Consolidated offices were recently opened in Los Angeles and St. Louis, with new locations in Boston and Montreal to be announced shortly.



CUTTING THE RIBBON, Mr. R. C. Gaugler, President of American Cyanamid Company, officially opens the company's new Chicago offices and warehouses. From this modern brick and steel, two-story building with 100,000 square feet of floor space, Cyanamid's Agricultural Chemicals Division, Calco Chemical Division, Explosives Department, Industrial Chemicals Division, Lederle Laboratories Division, and the Plastics and Resins Division will operate.

Chemical Newsfront



SITTING PRETTY? What young lady wouldn't be in an attractive cotton dress treated to resist wrinkling and soiling! Cyanamid's SUPERSET® Resin finish imparts these qualities to women's cotton garments, men's sports shirts and other apparel . . . makes them easier to wash and iron, eliminates the need for starching.

NEW CYANAMID PLANT at Michigan City, Indiana, boosts production of AEROCAT® Synthetic Fluid Cracking Catalysts. Put into operation this past summer by Cyanamid's engineers, this unit substantially increases Cyanamid's catalyst output, helps petroleum refiners meet the ever-growing demand for high octane fuels. Unique feature of the new installation: a spray-drier believed to be the largest of its kind in the world—used to form the catalyst into microspheroidal particles.

The new plant will supply refining areas throughout the Midwest, along the Atlantic seaboard and in Canada—supplementing Cyanamid's Fort Worth, Texas, plant which serves the Southwest and Far West.

American Cyanamid Company CW, 11-51
30 Rockefeller Plaza, New York 20, N. Y.

Please send literature or further data on the items checked:

☐ SUPERSET Resin Finish
☐ AEROCAT Cracking Catalysts

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Company.....
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City..... State.....

In Canada: North American Cyanamid Limited, Toronto and Montreal

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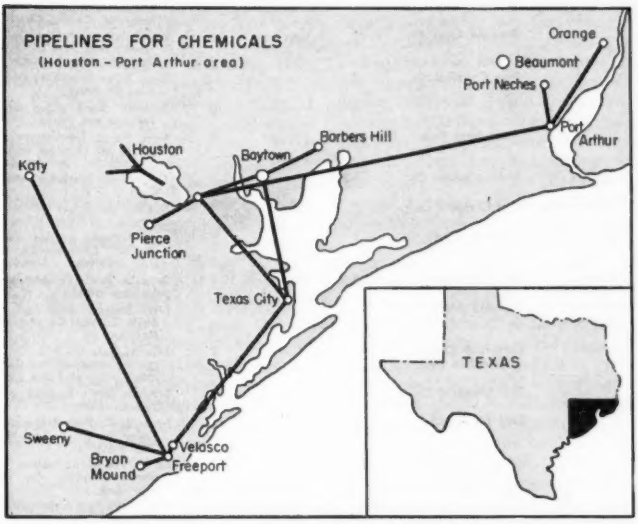


HOUSTON-AREA NETWORK: From milk of lime to propylene.

Chemical Freight Piped

Transport of chemicals through pipes is on the increase.

Larger quantities are being carried in the usual manner, particularly in Texas, by pumping them through pipes.

Most significant of all: use of natural gas to carry ethane from Texas to petrochemical plants in the Middle West.

More chemicals and more chemical raw materials are moving by pipeline each year. Some are riding "piggy-back" on the natural gas in pipelines from Texas to the Northeast. And in Texas itself, chemical pipelines extend up to 100 miles and criss-cross the countryside, particularly around Houston.

First of the new "piggy-back" facilities will soon be on stream: Mathieson Hydrocarbon Chemical Corp.'s for manufacture of ethylene glycol, oxide and dichloride near Brandenburg, Ky. "Wet" gas, containing ethane, propane and butane, is transported from Texas through the lines of the Tennessee Gas Transmission Co. to Gabe, Ky. Here nearly a billion cubic feet per day of gas is stripped of all components except methane. The propane and butane are sold as "bottle" gas for fuel, while the ethane is cracked to ethylene for use by Mathieson.

A second facility of this type is to be built for National Petro Chemicals Co. (50% National Distillers and half Panhandle Eastern Pipeline Co.) at Tuscola, Ill. In this case the bottle gas is to be sold by Phillips Petroleum Co., while the ethylene-from-ethane will be converted into ethyl alcohol and ethyl chloride. National says the extraction plant is to be completed by October, 1952, while final completion is scheduled for May, 1953.

Under study is a possible combine between Pittsburgh Coke & Chemical Co. and Texas Gas Transmission Co. *(CW, July 21)* for the same type of operation.

Within Texas Too: But use of pipelines to carry chemicals in the usual manner is also expanding. They are carrying an ever-increasing portion of the chemical freight within Texas. Today approximately 200 miles of chemical pipelines are planned or under construction in the Houston-Port Arthur area alone. Products carried include both raw materials (brine and propane) and items of manufacture (acetone, chlorine and styrene).

Such an extensive use of pipelines is probably natural to Texas, an area interlaced with tubular steel connections that have moved huge quantities of gas and oil for many years.

The trend to pipelines, however, has been abetted by the character of the chemical industry in Texas. Fulfilled is the major requirement for low-cost usage of pipelines: The quantity of product or intermediate to be moved between two fixed points must be extremely large *(CW, Sept. '50, p. 349)*. There is only a small difference in the cost of laying and operating a 1-inch or a 6-inch pipeline; and the larger pipeline will move more than 36 times as much material as the smaller line. Consequently, pipelines are not for the small producer.

Brine First: Pipelines to carry brine are not new; indeed, they were the first to be installed. Many of the major alkali or alkali-chlorine plants have moved their raw material from brine to plant for years. Such is the case in Texas. But Texas Brine Corp. has added a fillip of its own. It has a 20-mile transite line along the Houston Ship Channel to service not one but several of the salt-users in that area. A grand total of 113 miles of brine lines are in operation or under construction.

Ethylene Pipes: Completion of the network (over 150 miles) of pipelines needed to distribute ethylene from Gulf Oil Corp.'s plant, now under construction, will bring the length of ethylene pipelines up to a sizable 250 miles. Interestingly enough, ethylene pipelines have reached such a venerable age that one 42-mile line is no longer in operation. About 1942 this line was built from Texas City to Freeport to carry liquefied petroleum gases (LPG) from Texas City to Dow's Freeport plant. During World War II it carried ethylene, but it has since been placed on the shelf until a use can be found.

The fate of this line illustrates the great danger of all pipelines: their lack

of flexibility. A shift in market can change the line from a profitable freight carrier to an elongated—and empty—hole in the ground.

Eleven separate lines are now used to move eight different products the eight miles between Dow's plants at Freeport and Velasco. Products carried: brine, gaseous chlorine, LPG, ethylene, propylene, milk of lime, styrene and hydrogen.

More to Come: More and more pipelines will be utilized as the volume of more and more chemicals reaches a level where a line can be kept filled between two points. Because of the higher cost of laying lines in the population-rich East and the usually smaller volumes of products manufactured, it is questionable if the Texas network will be matched at any other location for years to come. But the number of lines in use will continue to climb.

Continued expansion of the network of natural gas pipelines that brings Texas natural gas to the rest of the country also promises more piggy-back petrochemical plants—using Texas natural gas, but nearer the market.

Glut or Dearth?

Synthetic rubber output is being jumped. RFC contemplates stepping up production from 760,000 to 860,000 tons annually. Bulk of output is GR-S, balance GR-I (butyl). The raw material picture is brighter: Vital benzene is now coming in from Germany, and the U.S. is stretching its supply of styrene by reducing bound styrene requirements from 23½% to 20%.

Even so, experts say that if a major war flares, America and the free world will need vastly greater synthetic production facilities than are now on hand. Even without war, some industry spokesmen (notably P. W. Litchfield, chairman of the board of the Goodyear Tire and Rubber Co.) contend that by 1960 the economy will be able to absorb an additional half million long tons of synthetic rubber annually. They see long-term shortages in the natural rubber market.

Rubber growers disagree. They figure the U.S. plans to have enough rubber of all types on hand for a five-year war. Since this means from 5 to 5½ million tons of rubber of all kinds, and since World War II showed at least 16% of this should be natural, this puts our stockpile requirements of the latter at something more than 800,000 tons. Opinion has it that the

CHEMICAL PIPELINES IN TEXAS

COMMODITY	COMPANY	LENGTH (MILES)	MATERIAL OF CONSTR.	DIAM. (IN.)	ROUTE
Acetone	Shell Chemical Co.*	3	—	—	From Shell's Deer Park plant to Rohm & Haas Co.
Brine	Columbia-Southern Chem. Corp.	63	Cast Iron	16	From Benavides in Duval County to Columbia-Southern at Corpus Christi.
"	Diamond Alkali Co.	17	Cast Iron	10	From Barbers Hill to Diamond's Deer Park plant on Houston ship channel.
"	Dow Chemical Co.	5	—	—	From Bryan Mound to Dow's Freeport plant.
"	" " "	8	—	10	Between Dow's plants at Freeport and Velasco.
"	Texas Brine Corp.*	20	Transite	8	From Pierce Junction to plants on Houston ship channel.
Butadiene	Sinclair Rubber Co.	0.25	—	—	To Goodyear Synthetic Rubber Corp.
Carbon Dioxide	Dow Chemical Co.	1	Steel	4	Handles stack gas at Dow's Freeport plant.
Caustic Soda	Diamond Alkali Co.	1	"	3	From Diamond at Deer Park to Shell Chemical Co. at same location.
Chlorine (gaseous)	Dow Chemical Co.	8	Steel	6, 10 & 14	Between Dow's Freeport and Velasco plants.
Chlorine (liquid)	Diamond Alkali Co.	1	"	3	From Diamond Deer Park to Shell Chemical Co. at same location.
Ethylene	Carbide & Carbon Chemicals Co.	35	—	8	From Humble Oil & Refining Co. at Baytown to Carbide's plant at Texas City
"	Dow Chemical Co.	8	Steel	4 & 8	Between Dow's Freeport and Velasco plants.
"	Gulf Oil Corp.*	76	—	8	From Gulf's Port Arthur refinery to Ethyl Corp. at Deer Park.
"	" " " " *	35	—	—	An extension of above to Monsanto Chem. Co. at Deer Park.
"	" " " " *	32	—	6	From Gulf's Port Arthur refinery to Du Pont at Orange.
"	" " " " *	2	—	—	From Gulf's Port Arthur refinery to Kopper's Co.
"	Monsanto Chem. Co.	1	—	—	Between Texas City plants of Monsanto and Carbide & Carbon.
"	Shell Oil Co.	1	—	—	From Shell's Deer Park Refinery to Diamond Alkali Co.
Hydrogen	Diamond Alkali Co.*	2	—	—	From Diamond's Deer Park Plant to Ethyl Corp. at Deer Park.
"	Dow Chemical Co.	8	Steel	—	Between Dow's Freeport and Velasco plants.
Hydrogen Chloride	Diamond Alkali Co.*	1	—	—	From Diamond's Deer Park unit to Rohm & Haas at Deer Park.
"	" " " " *	2	—	—	From Diamond to Shell Chemical at Deer Park.
LPG	Dow Chemical Co.	8	Steel	10	Between Dow's Freeport and Velasco plants.
LPG and Ethylene	" " "	42	—	4	From Carbide & Carbon Chem. Co. and Monsanto Chem. Co. at Texas City to Dow's Freeport plant.
Milk of Lime	" " "	8	Steel	8	Between Dow's Freeport and Velasco plants.
Oxygen	Houston Oxygen Co.*	Various	"	3	Pipeline network radiates from Houston Oxygen Co. plant to consumers in area.
Propane	Dow Chemical Co.	77	—	—	From Warren terminal on Houston ship channel to Dow's Freeport plant.
"	" " " "	40	—	—	From J. S. Abercrombie Co. at Sweeney to Dow's Freeport plant.
"	" " " "	85	—	—	From Humble Oil & Refining Corp. at Katy to Freeport.
"	Monsanto Chemical Co.	2	—	—	From Pan-American Refining Corp. to Monsanto at Texas City.
"	" " " "	¼	—	—	From Republic Oil Refining Co. to Monsanto at Texas City.
Propylene	Dow Chemical Co.	8	Steel	4	Between Dow's Freeport and Velasco plants.
Refinery Gases	Jefferson Chemical Co.	5	—	6-8	From Texas Co.'s Port Arthur refinery to Jefferson's Port Neches plant.
Styrene	Dow Chemical Co.	8	Steel	4	Between Dow's Freeport and Velasco's plants.

*Under construction or planned.

U.S. already has some 700,000 tons of natural on hand, and that stockpiling will end between six and twelve months hence.

But no one really knows how much natural rubber we're going to need. The military is plugging for an even bigger stockpile. They say our total rubber requirements for the next war will be substantially higher than World War II experience indicates.

But the rubber growers, taking no chances, are holding "exploratory talks" to see what they can do to keep up demand. Both the Natural Rubber Bureau in this country and Rubber Technical Developments, Ltd., in Britain are fishing for new natural rubber uses. If the glut comes, they want to be ready.

A Turn for the Better

The late but unlamented slump in the paint and lacquer business is making a quiet but quick exit. As sales pick up, manufacturers once more face the future with a good deal more optimism than they had two months back. Not that they look for a renewal of scare buying that cleaned out dealers' shelves early this year. It was fine while it lasted, but the 25% letdown afterward was a strong antidote. Most paint producers today would settle for less boom-and-thud and more slow-but-sure.

Area Rated: This sales trend is confirmed by statistics, but not the why and wherefore. For instance, the Southwest and Pacific Coast areas had almost no summer decline, are leading the recovery. A CW survey this week also shows that the Midwest is holding up better than the East Coast, sales-wise. But the broad national trend is definitely up.

MIXING: More of a rosy hue.

Advance Notice: Usually three main factors determine the slant of the paint sales graph: population growth, industry expansion, and government needs for mobilization. More people have been moving into the Far West and Southwest, thereby keeping up a strong demand for paints in residential construction and for civilian goods. Industrial paints and defense housing needs have mounted in those areas and elsewhere with the expansion of defense industry. Military requirements until now have been minor, but are slated to become more important in the next year.

A good share of the sales rise is due to the ready consumer acceptance of butadiene-styrene latex paint. This easy-to-apply boon to the spare-time painter has gained such popularity that manufacturers are still not able to satisfy the demand. This is partly due to lack of capacity and partly to styrene shortage. Thus far, latex paint has been limited to interior use, but an exterior type will hit the market soon, and when it does the industry will feel a strong impact.

Among industrial finishes, alkyd resins have made the most consistent strides. Here, too, progress would have been still faster except for the shortages of phthalic and maleic.

Short Subjects: Shortages, in fact, are the chief cloud on the paintmakers' horizon. The worst problem, phthalic anhydride, is due of course to the lack of naphthalene. Everyone is scraping the bottom of the barrel to meet customer commitments, and even the large companies are forced to pay as high as 15¢ a pound. Some phathalic suppliers leave it up to the alkyd formulator: "Three pounds of your naphthalene will get you a pound of our phthalic."

One sign of improvement: Sherwin-Williams' fluid catalyst plant in Chicago is back in operation, and yields with a new catalyst are best yet. Of even greater interest, S-W is now giving ortho xylene, alternate phthalic route, a thorough look.

Maleic anhydride has been—and is—short, but with the improved benzene supply, more should be available within the next year. The drier shortage is also a bothersome problem to paint makers. Reason: The armed forces need the naphthenates, and are slated to take still more *(see p. 51)*.

Changes Due: Except for these cases, however, the supply problems of paint producers should ease. Polyalcohols are in better supply, ethyl cellulose is more abundant than heretofore. Most pigments are simpler to come by, and some (e. g., cadmium lithopone) are definitely on the soft side. Extended titanium pigments are off allocation, but the pure pigment is largely spoken for.

SHIPPING: May need the big truck.

With generally better supplies and firm demand, paint producers now look for a continued rise in sales of protective coatings for industrial and consumer uses, and a sharp pickup in military requirements. For the long term, latex paint is slated to make over much of the paint industry.

Lignite Potential

As a tie-in with the Interior Department's public power program, Assistant Secretary William E. Warne is running around North Dakota trying to sell Federal exploitation of Dakota lignite. Warne's story: The Federal government could underwrite Dakotan prosperity if the lignite could be exploited through Federal power and irrigation projects.

North Dakota has 600 billion tons of lignite, about half of which is recoverable. Processed, these 300 billion tons, says Warne, could economically enter the mineral and metallurgical fields—not only as a source of power, but as reducing carbon, electrodes, gaseous reducing agents, and a source of thermo-process energy. In addition, he says, possibilities are just over the horizon for producing phenolics and other plastics, disinfectants and animal dips, wood preservatives, and detergent materials.

Apparently Interior has considerably more than an academic interest in Dakota lignite; it is already operating a research station in the region.

HUMPHREY: Unsurprising authorship.

Interlock Lockup

The bill to extend the ban on interlocking directorates in large corporations hasn't seen the legislative light of day. But while the bill was ignored by Congress before its adjournment last week, chemical companies can start planning now to keep possible future legislation from harming their management.

The measure, sponsored by Minnesota's Fair-Dealing Senator Hubert Humphrey, apparently was based on a 1950 Federal Trade Commission report on "harmful" interlocks* between the 1,000 largest corporations in the country.

Bill Provisions: The bill would prohibit any director, officer or employee of any company with over $60 million assets from serving as a director of another such company. If the two are in competition, the asset figure is reduced to $1 million.

If a company owns less than 50% of another company, it could not have board representation. A company like Aramco Oil, owned 30-30-30-10 by four oil companies, would have only its own president left on the board.

Another business area which would be disrupted: financing. Banks and insurance companies usually name at least one director to a debtor company to keep an eye on their investment. Severe limitation of this right might make financing harder to get.

Undoubtedly, such a law as the Humphrey measure would help prevent inter-company collusion on the director level. But it would have serious side-effects.

Myopic Planning: In their anti-trust zeal, government planners have overlooked the advantages that "outside" directors can bring. Undoubtedly, the overwhelming majority of directors who serve more than one corporation have no thought of restraining competition. Instead, they add to the management a broad outlook seldom possible otherwise.

Whether boards should be composed only of company management or include outside members has been often debated. Both can and do produce good management. Du Pont is an example of an excellently managed company with a 100% inside board. American Telephone & Telegraph, with a fine management record, has 89% outside men.

The fact that chemical management needs technical knowledge is one argument for an "inside" board. Proponents of boards with outside directors (not necessarily a majority of them) point to the broader viewpoint it gives. They say that since many chemical corporations sell primarily to other industries, they have tended to ignore responsibilities to the general public. On this score, outside representation tends to serve as a corporation's "conscience."

Merck (which has such outside directors as Vannevar Bush) showed its knowledge of public responsibilities when cortisone was being black-marketed. It purchased consumer advertising asking help in stamping out sales at exorbitant prices by refusal to buy at such levels.

Similar incidents can and have happened with an inside board. It is contended that outside members can provide the little shove that might be needed in borderline cases. Augmenting the anti-trust laws by preventing multiple directorships could definitely curtail the source of qualified outside directors.

Strange Bedfellows: In objecting to such directorships, Humphrey and others of similar kidney have stated that too few directors control the fortunes of too great a proportion of the nation's corporate wealth.

Support for this contention has now come from what might seem to be an unusual source—the American Institute of Management. AIM's president, Jackson Martindell, points out that FTC and the trustbusters have "a core of a good idea" in saying that there are too few directors, but that it misses the point of its studies. It is much easier for directors to pick someone they've met at another board meeting than to bring in someone new. For this reason, directorships are held by too few persons.

MARTINDELL: Surprising support.

Martindell feels that whether or not the law is passed, industry would do well to get new blood into its directorates. Perhaps the answer is to establish a directors' training program, bringing in persons from educational institutions, small business, and professional groups, who, by rubbing elbows and attending meetings, could someday become directors. These people, who wouldn't be affected by the Humphrey bill, also would help a company by giving it a broader outlook.

"The public," Martindell avers, "demands more of a company than efficient management. Encouragement of new, outside directors is a way for corporations to develop an awareness of public viewpoints."

Sea Moves In

Attention has recently been drawn to the problem of salt water invading the ground water of coastal regions. A $750,000 grant for research into means of combatting the situation was made by the last session of the California legislature.

Salt water intrusion can be a serious matter to chemical industries located in affected regions, since water cannot be used for industrial purposes if the salt content goes above a certain figure. At present three major industrial areas are faced with the problem: Western Long Island, Galveston Bay area, and the Los Angeles region.

* Sample: Manufacturers Trust Co. had 26 directors, one of whom was on the 12-member board of American Sugar Refining, another on the 22-man board of National Dairy Products. Since National Dairy buys sugar for some of its products, the corporations are "interlocked."

Essentially the problem in its present stage is a long-range one, but like many apparently long-range problems, it can become accute rather suddenly. Right now California is particularly vulnerable, hence the legislature's concern. While no one is exactly frantic about it out there, circumstances could arise that would change the picture overnight.

Eyes on Arizona: Up to now no plants have been abandoned, no production has been forced to cut back, no communities are faced with a water shortage. True, many companies, such as Standard Oil at its El Segundo plant, have, for some 15 years, been periodically abandoning wells and drilling new ones farther inland, although it is hardly a serious situation. But here's the catch: Arizona's claims to the water of the Colorado river.

A large part of the water in this region comes from the Colorado river, and if Arizona's claims are upheld, California's share will have to be cut. If this happens it will affect Los Angeles itself, which in turn will have to cut the supply to the West Basin area where sea water intrusion is the greatest threat to industry. Were this to happen, the situation would change from a long-range problem to one of important and immediate consequence.

Fresh Water Ridge: Because the danger has not been considered acute, all efforts to correct it so far have been experimental. Of the five possible methods that can be used, the California Dept. of Public Works is concentrating most of its work on building a fresh water ridge through the use of injection wells and surface spreading of reclaimed water. This is the method found most successful in other areas. The ridge operates by creating a level of hydrostatic pressure higher than that of the sea water, and thereby blocking the entry of the sea water.

The work being done is designed to solve not only the problem in the Los Angeles area, but also to provide a technique that can be used in other areas. The Department now believes it has established most of the factors necessary to a successful injection program. The California methods are more generally used than those being used on Long Island, where the fresh water is injected at the center of the Island to form a "hill" which flows outward and stops the salt water. This later method depends largely on the conditions peculiar to Long Island.

Too Close: The time is now getting a little too close. Salt water intrusion can become a serious problem in California, and the effect on industry in the state would be too serious for anyone to neglect. Much remains to be learned about the nature and occurrence of sea water intrusion, and considerable work has to be done before the threat can be even adequately countered.

Smallness on Asset

Recently a CW editor went to the Merichem Co., Houston, Texas, to find the formula to one small company's success in the highly competitive chemical industry. Merichem's answer: special petrochemicals.

Shortly after the last war, Ed Lewis, then assistant superintendent of Dow Magnesium Corp., and John Files, assistant chief engineer at the same plant, decided the time had come for them to go into business for themselves. The only question: What could they produce that would give them a place in an industry heavy with giants? Whatever they did would have to be carefully selected so that small size was an advantage, raw materials were readily available, and direct competition with the giants would not exist.

Go Where They Can't: Lewis and Files were convinced that smallness could be made an asset by entering a field where there were products that simply do not lend themselves to the large-scale production techniques associated with large organizations. With the Texas location and all other factors taken into consideration, petrochemicals were the logical choice. In 1945 it was a growing field, particularly suited to the raw material situation of the Southwest.

But the two budding entrepreneurs had no "angel" to back them, and with capital of only $5,000 were in no position to plunge immediately into virgin territory. Instead they took their capital, organized their company as Merichem Co., and bought the Merchants & Manufacturers Chemical Co. in Houston. This gave them a warehouse, some equipment, and a profitable business jobbing and compounding specialty products. With this as a basis Lewis and Files went to work developing their future products, preparing marketing plans, and drawing the designs for a new plant.

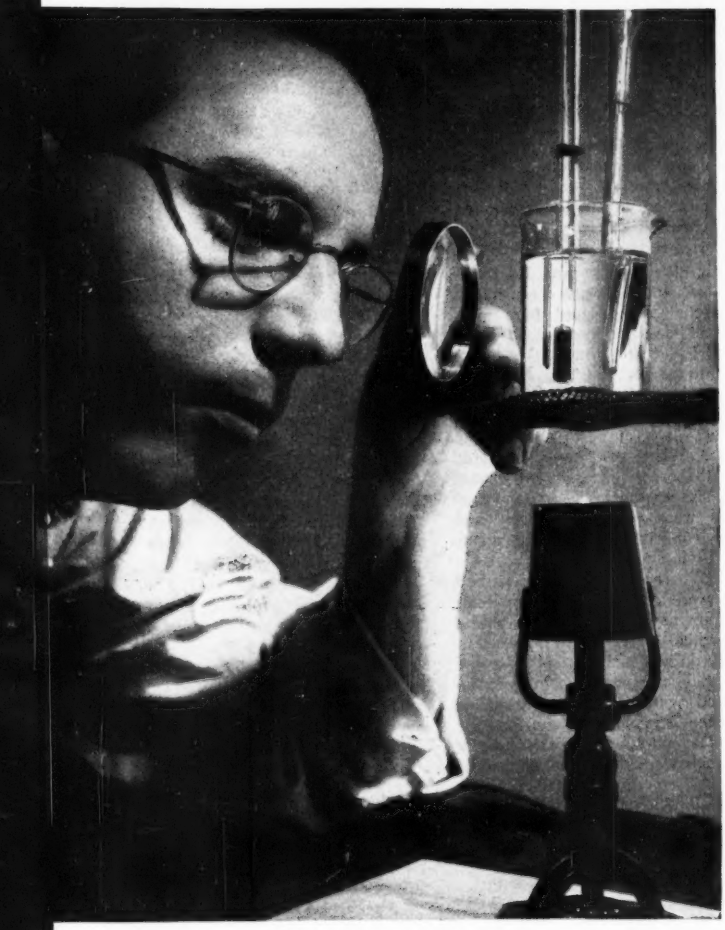
Spotlight on Cresylic: By 1948 they had decided on a line of cresylic acid, sodium sulfide, and paraffin waxes. An 18-acre tract of land was acquired, and construction was completed on the new plant in April of 1949. Upon completion of this plant, the company discontinued the stop-gap jobbing business the partners had bought in 1945.

Raw materials for cresylic acid comes from the nearby refineries of Texas and Louisiana. Three boiling ranges of the acid are being produced, the bulk in the lowest range.

Most of the cresylic acid is sold as a raw material for plastics, plasticizers (tricresyl phosphate), and as a chemical intermediate. Minor uses include disinfectants and ore flotation. Sodium sulfide, the company's second product, is used mainly in textile dyeing, in sulfiding ores, and in leather tanning. The wax is sold for candles, and is primarily an export item.

FILES AND LEWIS: Big frogs in their own pond.

"LOOKING FOR A *Monoester*, MISTER?"



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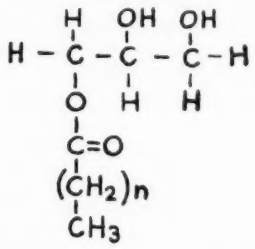

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Slow but Steady: Merichem's growth has not been spectacular; but, largely through retained earnings and business loans, the company now has total assets of about $500,000. While not world-shaking, this is a satisfying growth for Lewis and Files.

Although the two men had numerous offers from stronger financial interests to buy into the ownership, they have preferred to go their way, performing all the duties of sales, research and development, engineering, and management, and retaining the entire control in their own hands.

Salt or Sewage?

West Coast cities, faced with rabbit-like population increases, are casting covetous eyes on bottom land now occupied by producers of salt and similar chemical raw materials. The municipalities want the land for construction of sewage disposal facilities. Latest to be involved is the Leslie Salt Co., which faces condemnation proceedings by the city of San Jose on 1,865 acres of its salt-producing land. Leslie not only is resisting the action, but also is seeking additional acreage—including a 600-acre area which also may be condemned by the San Francisco bay community.

About half of Leslie's 991,000-ton 1951 salt production will go to West Coast chemical plants of such companies as Hooker Electrochemical, Dow, Pennsalt and Westvaco. The rest is exported or refined. (Profit margin on these operations is higher than in selling bulk salt.)

While the company is strongly resisting the condemnation, if the land were taken from salt production low-margin bulk salt sales would probably face a greater cutback than the higher-profit items.

Bulk salt sells for $3 per ton on the West Coast. Material of similar purity coming from Great Salt Lake would be available there only at a sky-high $11 per ton.

Despite the fact that the presently-used bay land is one of the few West Coast locations where salt can be produced, the company insists it will continue to supply its industrial customers and will not move from the Coast.

City Claims Disputed: In fighting the case, Leslie's consulting engineers strongly question the city's need for the land. Present city plans call for primary and secondary treatment which would use gigantic oxidation ponds. The ponds would cover some 2,400 acres.

The design is experimental in nature —such large ponds have never been used before. Also, recirculation of water with the sewage as part of the secondary treatment has never been applied on such a scale.

LESLIE SALT: Industry must publicize its importance.

Leslie's engineers contend that the city's plan would be impractical, as well as be a menace to health through the production of odors and breeding of mosquitos.

They also point out that only during the canning season would the ponds be used to capacity. They have presented an alternate plan, which would include the city's primary treatment plan, but modify secondary treatment so as not to use ponds.

City's Reply: San Jose officials contend that only with their plan can the city's wastes be taken care of for the least investment and operating costs consistent with the best community health and sanitation principles.

While this San Jose case is the only litigation now in the courts, the decision on it will affect company leases elsewhere in the Bay region. The cities of Sunnyvale, Santa Clara and Mountain View are thinking about condemning 600 acres of company land.

Not the First Time: Leslie isn't the first raw material processor to have its land involved in a condemnation suit. In 1947, the city of San Francisco condemned the plant site of the American Cream of Tartar Co. for the erection of a primary sewage treatment plant.

After tearing down the tartar plant, the city erected its plant at another site, and now leases the tartar plant location for commercial storage. American Cream of Tartar, though it received a fair price for its plant, decided not to rebuild on the West Coast.

In both this and the Leslie cases, the cities had a head start on the companies in preparation of their arguments. If nothing else, the incident at least shows that West Coast industry needs to be more active in publicizing its economic importance to the area.

In this type of cases, there seems to be quite a difference between the attitudes shown by chambers of commerce in trying to entice industry into the area and municipalities in trying to get them out.

FOREIGN. . . . . .

Antibiotics: Lederle Laboratories is considering the construction of a $6 million aureomycin plant in Australia. Final decision has not been made since Lederle's United Kingdom plant seems able to supply all aureomycin needed in the sterling-area countries at present.

German imports of penicillin are expected to stop when Farbenfabriken Bayer's new antibiotics plant at Leverkusen goes on stream in the near future. The plant will go into large-scale production of penicillin, will produce other antibiotics as well.

•

DDT: A new $1 million DDT factory in Brazil is ready to go, is only waiting for the approval of the United Nations International Fund for Child Welfare. Approval is needed since the U.N. agency is footing half the

bill. Expected to go into operation in early 1953, the plant will turn out 1,200 tons of DDT a year.

Located on the Rio-Petropolis Highway, the plant will be under the management of Brazil's National Malaria Service.

In Egypt a new DDT factory will be constructed at Kafr-el-Zayyat in the Delta. The Egyptian government has just appropriated an extra $285,000 for the work; the World Health Organization will defray the cost of installing machinery and providing experts for a two-year period.

•

Israel: A $5½ million loan from the Import-Export Bank of America has provided the capital for Israel's planned basic chemicals and fertilizer industry. Four large plants are already under construction in the Haifa Bay area to produce ammonia and sulfuric, phosphoric, and nitric acids. They are scheduled to go on stream in 1952.

The major part of the output of these plants will go into the production of single and triple superphosphate, ammonium sulfate, nitro chalk, and ammonium phosphate. The scale of production is such that 30% of the chemicals and fertilizer will go into the export market.

Raw material supplies are now being developed in the Negev to substitute for present imports.

Construction will also begin shortly on a glass factory that will meet all Israel's needs and provide material for export. The new plant, to be built at Beersheba in the Negev, is owned by Phoenicia Glass Co. of Israel and a group of Americans, on a fifty-fifty basis, and will up the Israeli company's production to 2½ million square meters of sheet glass and 100 million containers a year by December 1953. Sand for the factories is now quarried in the Negev desert rather than imported.

EXPANSION. . . .

Titanium: Production of metallic titanium has been started by Titanium Metals Corp. (National Lead Co. and Allegheny-Ludlum Steel Corp.) at its Henderson, Nev., plant. Output is scheduled to be expanded rapidly until a production rate of 10 tons per day is reached in the fall of 1952. This is equivalent to eight times the present world production rate.

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Cottonseed Oil: Union Oil Mill, Inc., at W. Monroe, La., has awarded a contract to Blaw-Knox for a plant to remove cottonseed oil from cottonseed by solvent extraction. With a capacity of 100 tons of cottonseed per day, the new facility is scheduled to be completed by May, 1952.

Cottonseed will be taken that has been given a light press to squeeze out some of the oil. The remaining oil is washed out with solvent. Blaw-Knox claims that the new unit will provide four more tons of oil per day than realized by pressing alone.

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Phosphate: Consolidated Mining & Smelting Co. has awarded a contract to Stone & Webster Canada, Ltd., for construction of a $9 million fertilizer plant at Kimberly, B. C. By-products from the nearby Sullivan concentrator will be used to produce 70,000 tons of ammonium phosphate annually.

The operation will require roasters, a gas cleaning plant, sulfuric acid unit, phosphoric acid unit and phosphate fertilizer plant. Completion of the plant is scheduled for early 1953.

Moreover, about 2,500 acres of phosphate mining property have been acquired by International Minerals & Chemical Co. in Maury County, Tenn. The deposit was acquired by exchange of all of the capital stock of Hoover & Mason Phosphate Co. for about 40,000 shares of International's common stock.

But at the same time, construction of International Minerals & Chemical Co.'s new $10-million defluorinated phosphate, uranium and multiple superphosphate plant at Bonnie, Fla., is moving much more slowly than originally planned. Latest estimates are that the job will be completed by April, 1953. Rust Construction is building the principal units, but the sulfuric acid plant is being erected by Leonard Construction Co.

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Lithium: Foote Mineral Co. has purchased the Kings Mountain, N. C., lithium property which it has leased from Allied Chemical & Dye Corp. for some time. The 881 acres involved cover substantial deposits of spodumene and feldspar.

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Alumina & Aluminum: Alumina will begin cascading out of Kaiser Aluminum & Chemical Corp.'s plant at Baton Rouge, La., within a very short time. Production is being stepped up from 300,000 tons per year to 540,000 tons per year, equivalent to 920,000 and 1.81 million tons of bauxite per year respectively. The new $7-million facility will begin production coincidentally with the completion of the first of four potlines at the company's 200 million pound-a-year aluminum reduction plant at Chalmette.

Guiana bauxite is now being utilized, but the new plant will use ore from Jamaica just as soon as shipments can be started about mid-1952. Bauxite from this source requires a somewhat different purification procedure from that utilized in the present plant.

KEY CHANGES . .

Adger S. Johnson: To president, National Carbon Co., Union Carbide and Carbon Corp.

Joseph R. Stevens: To vice president, J. T. Baker Chemical Co.

R. H. McCormac: To assistant to vice president in charge of resin and chemical operations, American-Marietta Co.

Charles F. Lunsford: From western manager, agricultural division, Pittsburgh Coke & Chemical Co., to head the newly formed agricultural chemicals division, W. R. Grace & Co.

George W. Poland, Jr.: From assistant sales manager, Stauffer Chemical Co., to vice president, E. M. Sergeant Pulp and Chemical Co., and president, Sergeant Chemical Co. of Newark.

William N. Noble: To assistant to the president, Ferro Corp.

J. H. Ginther: To assistant to the executive vice president, Ferro Corp.

William G. Luttge: From manager, viscose sales division, American Viscose Corp., to sales manager, The Chemstrand Corp.

Harold Reintjes: From associate director, Illinois research and development division, Great Lakes Carbon Corp., to special assistant to the director, research and development department, Godfrey L. Cabot, Inc., and to vice president and general manager, Petrocarb Equipment, Inc.

Harold E. Pletcher: From production manager, Ansco division, General Aniline & Film Corp., to assistant production manager, S. B. Penick & Co.

S. A. Montgomery: Elected to board of directors, Standard Oil Co. of Indiana.

A. C. Sailstad: To general manager, sales department, and elected to board of directors, Standard Oil Co. of Indiana.

J. W. Ross: To general sales manager, Standard Oil Co. of Indiana.

Kenneth W. Hartley: To manager, Chicago office, Dodge & Olcott, Inc.

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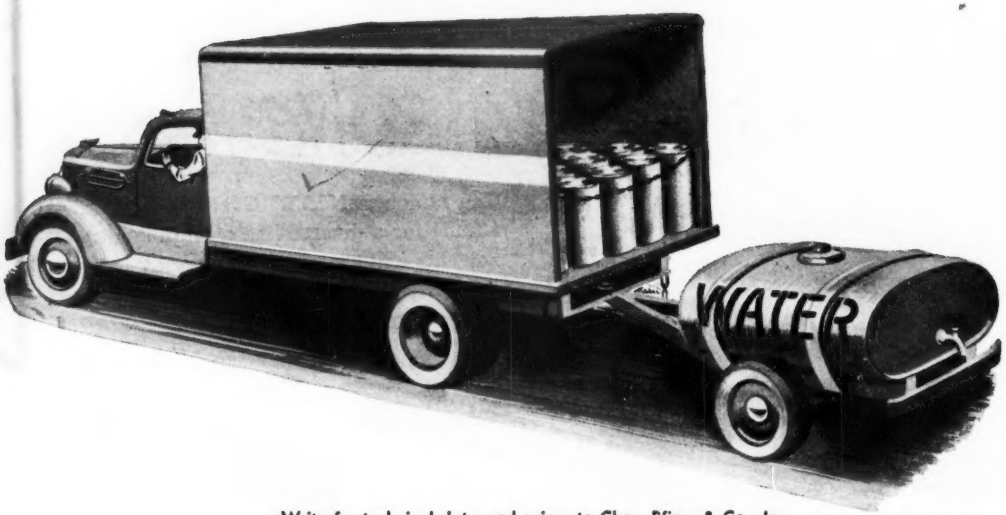

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Conclusions, released to cooperating organizations, should show management how to get more for its research dollar.

DAVID HERTZ: Time for a close look.

Research, at best, is a risky business. Input in terms of talent, time and money is usually high; results are never guaranteed. How to get the most out of research long has been of more than academic interest to industrial management. Unfortunately no one has found a sure-fire formula.

But a long step in the right direction is being taken by Columbia University's Center for Studies of Research Administration. Under the able direction of David B. Hertz, the Center is now well into the first stage of an industry-wide survey of research organization at the group level. The survey's aim: to discover the prevalence of research teamwork, probe the structure of different research teams, pinpoint the most successful type of setup.

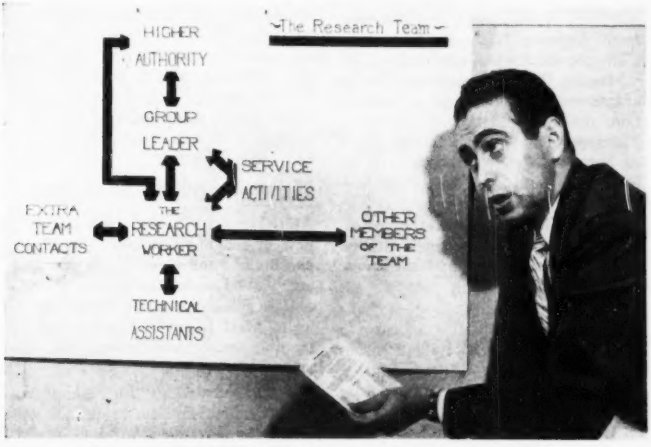
Hertz is no novice at his job. In addition to heading up the Center, he has contributed much to the literature* and is the guiding spirit behind Columbia's industrial research conferences, which yearly bring together the most prominent figures in research management.

But more important, Hertz is dedicated to an idea. Simply it's this: Teamwork is the key to successful research. Three scientists working as a team can solve a problem far more easily than if they each went their own solitary way—and so much the better if they are specialists in different fields.

This isn't a revolutionary concept. It's no secret that in the past few years industrial research has come more and more to depend upon teamwork—the ability of chemists, physicists, biologists, etc., to operate as members of a closely-knit creative group. That's exactly why the Columbia survey is important; the time is ripe for a close look at the system.

Hertz, assisted by industrial engineer Albert H. Rubenstein of the CSRA staff, hopes to find out what specific patterns of administration and organization make for the optimum team creative effort. They feel the crux of the problem lies in the communication channels centered around the individual researcher; but that's as much as they'll say before their survey data is in the house. At any rate, their findings—in the light of a growing shortage of technical personnel—will be top-priority reading for chemical research executives.

* Including a recent book, The Theory and Practice of Industrial Research.



ALBERT RUBENSTEIN: Needed, a pattern for creative efficiency.

Accent On Industry: Sponsored by the Office of Naval Research, the actual survey project is divided into three phases. In the first (and current) phase, a questionnaire is being mailed out to about 2,700 industrial research laboratories, the various government facilities and a select group of academic laboratories. This questionnaire will determine the extent of team research and research conferences, the composition of teams, and effective administration techniques.

The second phase will come after a careful weeding-out period. Approximately 50 laboratories, taken as representative on the basis of questionnaire results, will be selected for further study. Researchers, administrators and service personnel will be interviewed to provide fuller information on team organization and administration. Interview results will then be classified and checked against questionnaire answers.

In the third part of the program a number of laboratories, chosen from the 50 studied previously, will get an intensive going-over. Individual teams will be scrutinized and the pattern of communications surrounding the workers checked by several different methods.

Many intangible factors will have

to be evaluated; and here the project is truly on its own. The power of the group to complete tasks, for example, is one of those not-so-easy-to-define variables. Although company reports, patents, and published research papers will help on this score, Hertz admits that the opinions and impressions of the team members will play an important role in the final estimate.

At the conclusion of the survey CSRA will prepare a report for cooperating organizations which will serve as a guide for research management in the use and organization of team research. Moreover, the report will gage the extent to which such teams are used, their importance in the national research structure, and indicate areas for further study.

The team idea is no heaven-sent panacea for the ills of research. Rather, it's a sound scheme that merits a lot of attention as a means to greater creative efficiency.

As Hertz puts it, "Team research can pay off, but the team itself must be created and maintained. It's not just a matter of choosing some top-notch scientists, putting them together in a room, tossing them a problem and waiting for them to grind out the answer.

"People have to get to know each other, to be able to communicate with each other, and to be able to work together. . . . Given time to learn each other's ways of thinking and behavior, they as teams have a great deal to contribute to the industrial research process."

Proportional Twist

A simple, new, direct-reading survey instrument for the detection and measurement of radiation is research news from Argonne National Laboratory, Chicago, Ill. Unlike conventional instruments, the new meter requires no adjustments, zero-settings, or calibrations during its lifetime.

Moreover it has no switches to throw or buttons to push; the meter is always "on" and set for instant use. Because the amount of operating current is almost negligible, the instrument's operating life is really limited only by the shelf-life of its battery.

Small enough to fit into a coat pocket and weighing about a half-pound, the instrument is as easy to use as it is to handle. Radiation-rate readings are taken directly from a small window in the top of its plastic case. Ordinarily the meter measures up to 100 milliroentgens of radiation per hour, but its range is quickly

FRANCIS R. SHONKA: For direct reading, a quartz fiber.

boosted to 50 roentgens per hour just by turning it over, which drops a billion-ohm resistor into the measuring circuit. When the meter is restored to its original position, it once more reads in the lower range.

Measurement in the lower range is most frequently used for health survey work in hot laboratories. The higher range is intended for measurement of radiation from much larger quantities of radioactive materials. (Catastrophe surveying is a good example of this application.)

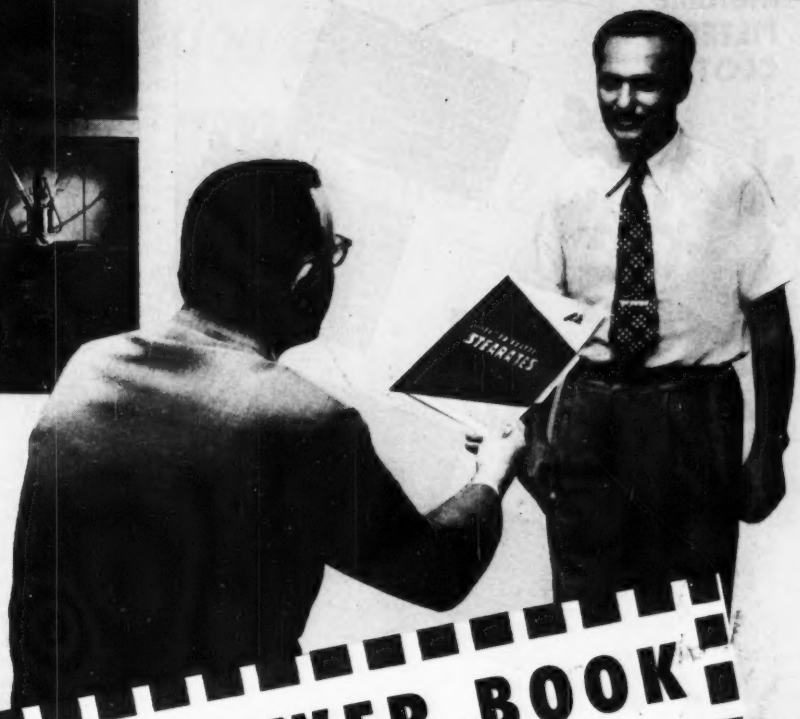
Small but Tough: Development of the handy little instrument came about as a result of work done by Argonne's Instrument Research and Development Div.

Headed up by Francis R. Shonka, the group has come up with a simple, rugged, yet highly-sensitive quartz-fiber electrometer. Briefly, here's how it works. The tiny quartz fiber in the electrometer twists when irradiated; the degree of twist is proportional to the intensity of radiation. An image of the fiber is projected on a calibrated scale to give a direct reading.

New Verdict Wanted

Atlas Powder Co. will soon launch a new investigation of its polyoxyethylene bread emulsifiers. These products are banned under the proposed Food & Drug Administration bread standards; Atlas hopes the results of its pending study will reverse the unfavorable decision.

The company wants the Federal Security Administration to permit the use of the emulsifiers in bread for the two-year duration of research. But



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whether or not this permission is forthcoming, Atlas will probably go ahead with its research program. And for a good reason: Despite the FDA stand on bread emulsifiers, Atlas has faith in the harmless nature of its products, believes they will give a good account of themselves.

This won't be the first time the polyoxyethylenes have been probed for toxicity. Atlas already has done considerable work along this line and, in fact, is in the midst of a lot more. But the experimental results presented thus far haven't been able to still the emulsifier critics. With its upcoming project, Atlas hopes to settle the issue.

Plans for the experimental program were drawn up on the basis of advice from the technical staffs of the FDA and the Food Protection Committee of the National Research Council. Procedures outlined by the FDA's Arnold Lehman (and associates) will be the backbone of the study.

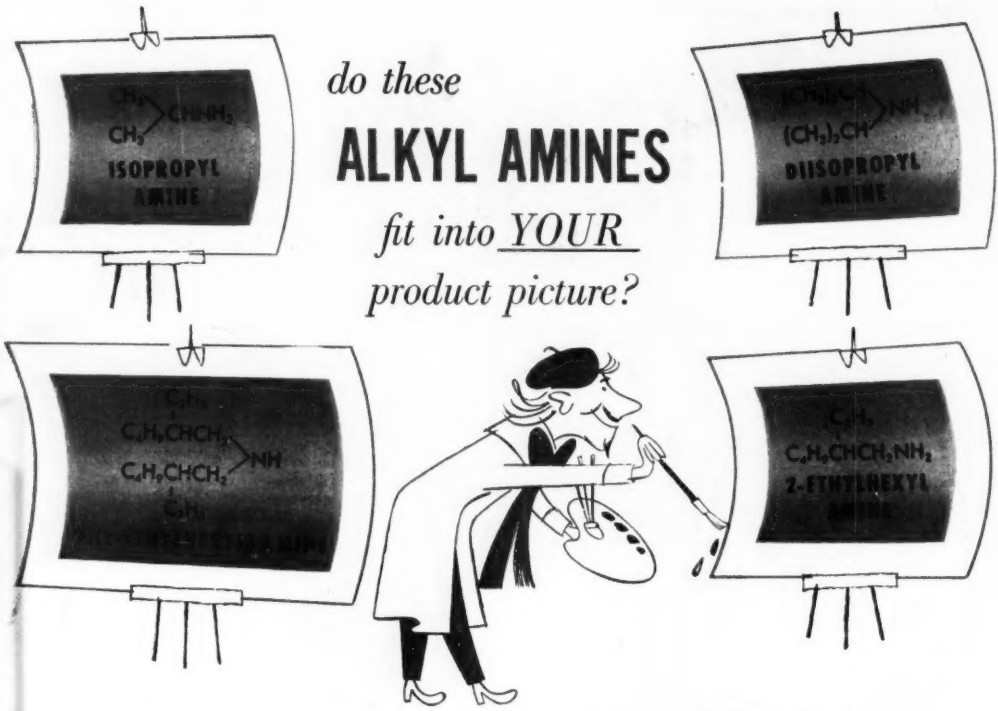
J. Peter Kass, Atlas' research director, will head up the important project. An all-out effort will be made to get a complete picture of the emulsifiers' physiological effects, if any. Another important item on the agenda: a study of how well the disputed polyoxyethylenes stand up to cooking temperatures. Because of the proposed program's sizable demand on space and personnel, Atlas will let contracts for the research to independent testing laboratories.

When completed, in about two years, Atlas hopes its investigation will close the emulsifier case with an indisputable acquittal.

•

New Resins: General Mills is making several additions to its line of polyamide resins. First of these is Polyamide Resin 90, a tough copolymerization product of polybasic fatty acids with ethylene diamine. The product is resistant to grease, oil, alkalis, mild acids and many organic solvents. Plasticized, the resin may be used as a paper coating. Other promising uses: molding compound, coating for electrical equipment and modifier for other resinous products.

Another newcomer is Polyamide Resin 100S, a soft, tacky material made by condensing unsaturated vegetable oil fatty acids with diethylene triamine. Resin 100S shows strong adhesion to metals, glass, plastics, rubber, paper and leather. Moreover it's compatible with many resinous substances, worth considering as a plasticizer. Mixing the new resin with other polyamides produces materials which form flexible, resistant coatings.



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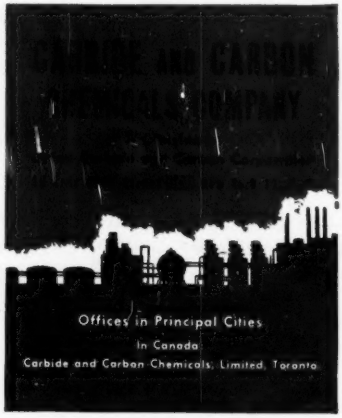
useful in the syntheses of dyestuffs, insecticides, and emulsifying agents. Since their octylamino groups contribute hydrocarbon solubility to many compounds, these amines should be considered when this property is desired.

Di(2-Ethylhexyl) Amine also shows promise as a cationic-type flotation agent.

These four amines are available in commercial quantities. One of them may be just the answer to your product or process problem. Investigate them now by asking for samples and information on your company letterhead. Be sure to ask for technical bulletins F-7408A, "Alkyl Amines," and F-6473, "Ethylhexyl Amines."

Physical Properties

	Isopropyl Amine	Diisopropyl Amine	2-Ethylhexyl Amine	Di(2-Ethylhexyl) Amine
Specific Gravity at 20/20°C.	0.6881	0.7178	0.7894	0.8062
Boiling Point at 760 mm., °C.	32.4	84.0	169.2	281.1
Vapor Pressure at 20°C., mm. Hg	460	70	1.2	0.01
Solubility in Water at 20°C., % by Wt.	Complete	Complete	0.25	<0.02



Silicone Process Scramble

Silicone producers are still jockeying for process position in the race for more silicones—cheaper.

Dow Corning pioneered the Grignard, but is now switching to the direct process which is used by General Electric.

Linde and Plaskon have processes that employ the addition of olefins to silanes.

Consumer acceptance following some imaginative work by the admen made silicones* a magic phrase in 1950, when production reached the thousands of tons class. Now— with defense needs mounting and all uses broadening—output is due for another fat boost.

Dow Corning has already received a certificate of necessity for a $560,000 silicon metal plant, is now waiting action on other silicone facilities. And General Electric, while it has disclosed no definite plans, is due for expansion.

The third major producer, Linde, merely says it has "no finalized plans." But Plaskon Division (Libbey-Owens-Ford) will cut the price of its alkyd silicone resins this week. Expansion of its semi-commercial plant for silicone intermediates is a safe bet.

Process Scurry: Since the entire field of silicone chemistry is still in its relative infancy, most companies are loathe to discuss process details. As one put it: "We're all still jockeying for process positions; our competitors may find out what we're doing but we aren't going to make it easy for them."

However, all the commercial processes have three steps in common: formation of the intermediates, hydrolysis, and polymerization by condensation. Furthermore all the processes rely on alkyl—or aryl—chlorosilanes as intermediates. And all produce at least three variations of the intermediate: mono, di, or trichlorosilanes.

In general the dichloro compounds are the desired product since they are bifunctional. But the trichloro compounds are necessary for cross-linking, the monochloro for chain-blocking.

Borrowed From Organic: For the first commercial silicone production Dow Corning chose a classical tool of the organic chemist, the Grignard reaction. In the process, an alkyl or aryl Grignard is reacted with silicon tetrachloride to form the corresponding chlorosilane.

From some standpoints the Grignard process is the simplest approach to the problem; certainly it is the most flexible. On the other hand, it requires many steps, is somewhat cumbersome. Furthermore, since the silicon tetrachloride contains only 16% silicon, the process entails a lot of starting material to get a small amount of silicon in the product.

In any event, Dow Corning, although still operating a large unit for silicones via the Grignard, has indicated a switch to the direct process which is the one used by General Electric.

In the direct process, elemental silicon reacts with a hydrocarbon halide in the presence of a copper catalyst. For the production of phenyl silicones, silver has been found more suitable as a catalyst.

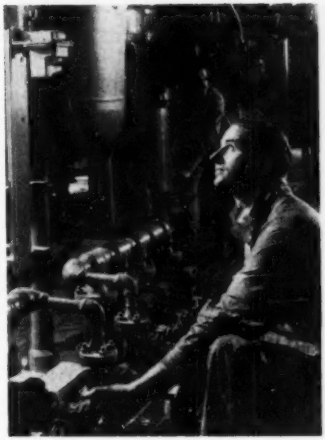
Olefin Approach: There are several alternative processes open to the silicone producer. One of the most attractive is the straight addition of olefins to silanes. Cheap ethylene, for example, can be added to trichlorosilane (also cheap) to form ethyltrichlorosilane. To get the desired dichlorosilane, aluminum trihalide catalyst is used.

One objection to the process is that the catalyst is a vapor at the reaction temperature, leaves the reactor with the product. Under normal conditions, then, the process must be carried out batchwise. But Plaskon has a continuous process involving the substitution of an aluminum-zinc-chloride complex as catalyst.

Linde also has a process that lends itself to olefin addition to silanes. Presently the company is not producing commercially desirable methyl silicones but is known to be interested in them. Its process consists of heating the trichloromonoethylsilane (product of ethylene and trichlorosilane which is made from hydrogen chloride and silicon) with hydrogen in the presence of a boron trihalide catalyst. Principal products are methyltrichlorosilane, dimethyldichlorosilane and silicon tetrachloride. Yields of the first two can be increased by recycling the silicon tetrachloride.

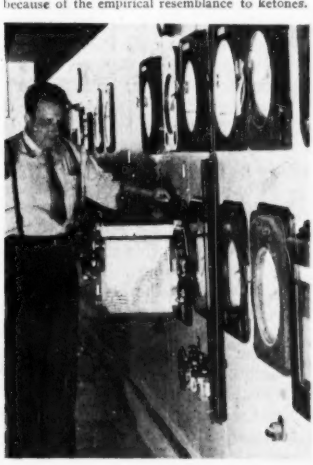
Another Linde process consists of treating silicon with vinyl chloride to get either divinyldichlorosilane or vinyltrichlorosilane.

Most experts agree that researchers have barely scratched the surface in finding new applications for silicones. More applications of course will mean more demand, more production, new producers—and new processes. It is impossible to predict the trend of future processes but Dow Corning's switch to the direct process indicates that Grignard is on the way out.

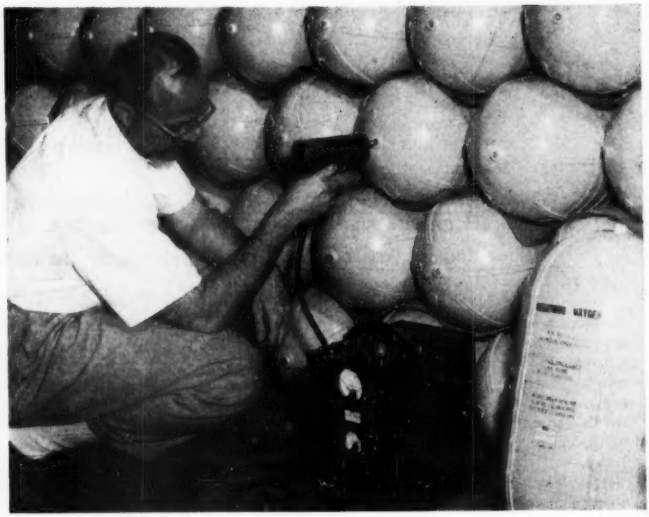


G. E. PROCESS: Direct method replaces the Grignard.

* Originally British silicon researcher, Kipping, dubbed R_2SiO compounds as silicones because of the empirical resemblance to ketones.



HYDROLYSIS CONTROL: Common denominator for all silicone processes.



Halogen Detective

QUICK DETERMINATION of halogens in air can be obtained through the use of General Electric's Type H leak detector. The tester merely places the probe of the gun into each cylinder, a gage tells him whether or not halogens are present. Sensitive element inside the gun is platinum which is activated by halogens, causes a high ion emission. Presently, the gun is being used to assure flyers a source of pure oxygen.

Flexible Fluorinator

Flexibility is a major attribute of J. H. Simons' cell for electrolytic fluorinations. The first large-scale unit to use this device is now going onstream in Minnesota Mining & Manufacturing Co.'s (3M) new pilot plant at Hastings, Minn.

Pulling up to 10,000 amperes, the new electrolytic cell is charged with a mixture of anhydrous hydrogen fluoride and the organic material to be fluorinated. A third component, such as sodium or potassium fluoride, is sometimes added to increase the conductivity of the mixture. What products are obtained depends on the material charged and the operating conditions in the cell.

Simons' interest in fluorochemicals dates from his association, in the early '20s, with University of California's Professor J. H. Hildebrand. After leaving California, Simons moved to Penn State where he invented the present cell. The initial patent application, made in March, 1941, resulted in USP 2,519,983 (1950). 3M's support of Simons' work began in 1943; work started in the company's Central Research Laboratories at St. Paul, Minn. in 1946. A 2,000-amp. cell was completed at St. Paul in 1947 and has been in continuous operation since that time—up to 3,000 hours without shutdown.

About a dozen cells of differing capacities are now being studied, including microcell facilities for exact work on fundamentals of electrochemical fluorination of organic materials in liquid hydrogen fluoride.

Synergism: A form of "synergism" has been observed in the operation of the Simons cell. Use of two or more organic starting materials in some cases improves operating efficiency. For example, efficiency of the electrolytic fluorination of hexyl ether is improved if carried on in the presence of propionic acid.

Most important, the Simons process fluorinates completely in the absence of the elemental gas. Fluorine is transferred to the organic compound from the liquid hydrogen fluoride under the influence of the electric current—which must not exceed a certain minimum value. If it does, elemental fluorine is liberated with disastrous consequences to the cell. Moreover, elemental fluorine fragments the organic molecule; the Simons process, however, since it does not cause fragmentation, provides a ready method for preparation of high molecular weight fluorinated organic materials.

Briefs

From recent literature

Carbamate esters—especially suitable for use as plasticizers and high boiling solvents—can be prepared by reaction of a polyglycol bis haloformate, such as diethylene glycol dichloroformate, with a secondary amine. The temperature at which the reaction can be conducted depends upon the hydrogen chloride acceptor used. With pyridine or aqueous sodium hydroxide, temperatures below 25°C. are preferable and with calcium carbonate, temperatures as high as 50° to 100°C. are desirable.

Molded brake linings can be manufactured by use of a mixture containing a resin plasticized with a hygroscopic material, such as diethylene glycol. Approximately 1.4 weight per cent of the total mix must be plasticizer. These mixtures can be compressed at normal temperatures to the desired final form and curing accomplished by passing through a suitable oven without the application of pressure.

Purification and dehydration of natural and refinery gases can be effected simultaneously through the use of combination absorbents, such as monoethanolamine and diethylene glycol. Important improvements over prior processes have been achieved by the addition of low cost organic diluents to reduce substantially the solution viscosities. This results in more efficient contact of the absorbent with the gas and therefore reduces plant costs.

These developments are abstracted from recent publications or U. S. patents. They may suggest other applications of Jefferson Diethylene Glycol in your products or processes.

SIMONS: Fluorination without fluorine.

Organic compounds with about twenty carbon atoms usually are solids and represent the practical upper limit for employment of the process. Presumably, the upper temperature limit is set by the volatility of hydrogen fluoride.

The current passes between alternating iron cathodes and nickel anodes. The fluoro derivative is continuously discharged at the anode as a gas or liquid, and purified by distillation.

Dollars and Cents: The high cost of many fluorinated organic compounds so far has been largely due to the inefficiency of experimental production. Volume production is expected to reduce costs considerably with consequent wider use by industry. Trifluoroacetic acid, for example, now costs $5/lb in carboys; it is expected eventually to hit $1-2/lb.

Wet Bottom

The St. Joe Paper Co., Port St. Joe, Fla., is the latest pulp manufacturer to climb aboard the growing bandwagon of the wet bottom electrostatic precipitator. The Florida company is the fourth to place its order with Research Corp., manufacturer of the new equipment.

The precipitators, intended for handling gases from two new spray-type recovery furnaces in a new extension of the company's plant, have a guaranteed efficiency of 93% for the recovery of sodium salts from waste materials.

No Dust: This wet system eliminates handling any dust in the dry state. Rather than bringing the dust to the black liquor, the wet bottom unit has a liquor tank at the bottom of the Cottrell precipitator, forming an integral part of the precipitator itself. The liquor is then brought to the dust, taking it up into solution or suspension for discharge to the disc evaporators.

Research Corp. claims that the new system eliminates steam coils and heat insulation formerly needed to prevent condensation in the hoppers, and eliminates hopper vibrators and steam-jacketed conveyors.

EQUIPMENT . . . .

Bolt Sealer: A new rubber lined bolt sealer, introduced by Allis-Chalmers Manufacturing Co., is designed to minimize dripping of pulp or slurry from improperly sealed bolts when wet grinding in ball, rod, and pebble mills.

Tests showed resistance to leakage at pressures up to 85 psi, and the new valve is claimed to make considerable saving in down time. Providing a double seal, around the circumference of the sealer and around the bolt threads, the sealer is said to eliminate splitting due to diametric expansion, and does away with a special retaining ring.

•

Controller: A non-indicating force-balance controller, particularly adaptable to flow, liquid level, or pressure applications requiring fast reset rates and broad throttling bands, was recently introduced by Taylor Instrument Co. The new instrument is designed for application where it is desirable to transmit the measured variable to some remote location.

A notable feature of the instrument is its simplicity of operation, having only one knob to adjust both proportional and automatic reset responses.

•

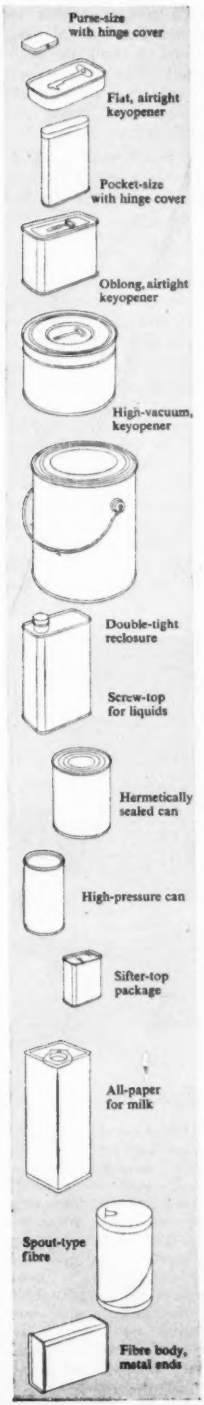
Cylindrical Carboy: A cylindrical plywood carboy, ICC-approved for both hazardous and non-hazardous liquids, has been designed by Seymour & Peck Co. specially for export use.

The cylindrical shape is claimed to reduce necessary storage space up to 30%, and the plywood structure makes the carboy 50% lighter than conventional types. An inner plywood jacket eliminates the need for filler packing, provides protection from impact.

•

Leak-Proof Valve: A new valve seal made by Rodic Chemical & Rubber Corp. is said to be leak-proof, long-wearing, easy-operating, and inexpensive, because it operates with—rather than against—the fluid flow. The cone-shaped seal is closed in the same direction as the movement of the liquid.

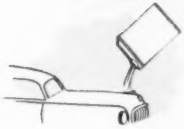
WHICH PACKAGE SUITS YOUR PRODUCT?



Did you know that...

This container  is used for Pancake Syrup

And also for Salad Oil 

 Not to mention Anti-Freeze

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PRODUCTION. . . .

A cup-shaped conical washer incorporates an imbedded metal plug, which is designed to eliminate bending and warping. The rubber part of the seal is compounded to withstand oil, grease, steam, water, and most industrial chemicals.

The company says the seal is adaptable to most present valve designs, and other devices for the control of liquid and gas flow.

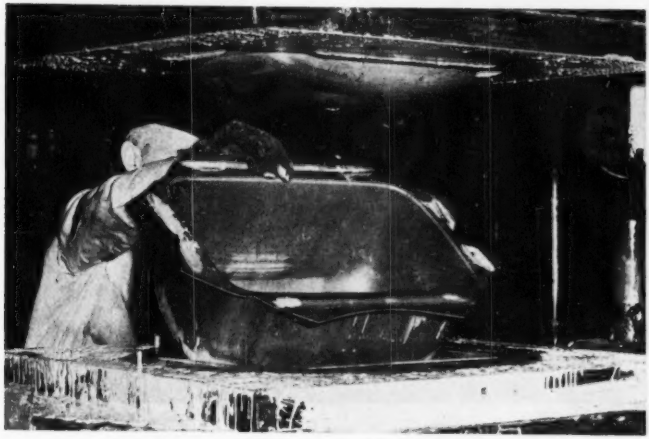
•

Compressor Valve: An automatic air-check valve for installation on the discharge line of air and gas compressors has been developed by Pennsylvania Pump and Compressor Co.

Originally designed to protect compressors from carelessness in leaving valves closed when starting up, the company claims new studies have shown a wider range of usefulness. Among other things, the valve is said to prevent leakage of pressure during the "off" cycle, dampen pipe line pulsations, and permit repairs without shutting down the system where more than one compressor is on the line.

Airless Blasting

PAINT CLOGGING of centrifuge baskets posed a problem for Eastman Kodak during one of its film manufacturing processes. Film spools were coated with lacquer, then placed in a centrifuge basket to remove excess liquid. After repeated use, the baskets were covered by layers of the lacquer, were unfit for service. The old solution was to place them—one at a time—in a blacksmith's furnace where the excess paint was burned off. Now, they are cleaned by an airless abrasive cleaner which hurls metallic particles from a spinning wheel. Net result: A cleaner, smoother operation.



COLD FORMING METALS: Another target, better bullets.

Bull's Eye and New Targets

Corrosion is the target and hitting the bull's eye means at least $20 million a year to phosphate coating chemicals producers. That's why they're revamping formulations.

But they're also looking for new fields of application, and cold forming of metals looks like a coming big one. It is also one that brought a new company—Pennsalt—into the field.

It takes some time for it to be apparent that corrosion has been at work on a metal. Likewise, it isn't obvious to the casual chemical observer that anything has been going on in the phosphate coatings industry. It seems that iron, zinc or manganese coatings have been used as anti-corrosion treatments and for paint bonding for years.

Actually they have been used for years, but plenty new is happening: Producers of the zinc phosphate types, faced with growing competition from new iron phosphate formulations, are incorporating anti-sludging agents and better accelerators in their solutions. More in the field are coming out with the new-type iron materials. And all are turning their attention to cold forming of metals which offers a huge potential market for such products as lubricants.

One of these processes—the Fos process *(CW, July 21)* developed by metals fabricator Heintz Manufacturing Co. and Pennsylvania Salt Mfg. Co.—brought a new factor, Pennsalt, into the field. Pennsalt developed a group of chemicals including a coating and special lubricant that makes Heintz' cold steel extrusion process click. The coating, trade named Foscoat, is a zinc phosphate type, and Pennsalt has just begun to market such a one for paint bonding, too.

Pennsalt, in addition to the zinc, has an iron type coating, as well as a phosphoric acid type for specialty finishes. These coatings—called Fosbond—are soon to be used in conjunction with the Fos process on ordnance items, so their use will grow big fast. The items will be formed with the aid of Foscoat, finished with Fosbond materials.

All of these phosphates are applicable to civilian products, too. This means that companies in the paint bonding field are in for new stiff competition. For Pennsalt has a lot of experience in selling specialties, and, equally important, has many prospects for phosphates already on its metals cleaning compounds customer list.

Full Circle: Although zinc phosphate types seem to be better for cold forming of metals, and are still by far the most popular types* for paint bonding, iron phosphate coatings have experienced somewhat of a renaissance in the past few years. Iron phosphate was the material originally found to intimately coat the surface of iron, suppress corrosion. From this, development led to zinc and manganese phosphate formulations, which were easier to apply and gave a better coating.

In paint bonding, the phosphate coating suppresses corrosion under the paint film, forms a layer that is part of the metal and keys the finish to the surface. Actually there is a chemical bond between the paint and the surface. Zinc phosphate formulations became the largest seller in this field.

The phosphate coatings also absorb oils and lubricants (reason for their use in new metal working techniques). This characteristic led to its use to increase corrosion resistance and reduce wear of metals. Manganese types from this function, and their use for coating pistons and the like became widespread. For the same reason, zinc solutions of the "slow" bath type (in contrast to the fast dip or spray used in prepaint applications) are also used on a variety of iron and steel items—nuts, bolts, etc.—prior to oiling for rust prevention.

The iron phosphate solutions on the market today are a far cry from the early solutions of iron filings in phosphoric acid. They are alkali metal-iron phosphate complexes which contain accelerators which permit very rapid coating (1 to 5 min.) that can be applied by spray or dip. These accelerators, key to the materials, are oxidizing agents that form heavy metallic oxides or phosphates along with the iron phosphate, and also become part of the coating. They are only relatively mildly acidic (pH of 4.5) in contrast to the older iron solutions, and may have cleaners incorporated in the bath. Also important, they form thin, hard coatings that are highly continuous and take a good finish.

Many Coming In: These new formulations have been responsible for the marked pick-up in sales of iron types. (One conservative estimate: More than 5 million lbs. are sold a year, a sevenfold increase over 4-5 years ago.) While they represent economy of use, they do not deposit a heavy enough coating to meet Government specifications (150 mg./sq. ft.); hence zinc types still get the nod for such jobs. But many companies closely identified with zinc types have been forced to bring out such products to meet the competition. These are used only for prepaint treatments, are not oiled.

One of the major objections to

* Of an estimated $20-25 million-a-year market for phosphate coatings, one estimate is that iron types represent about $3 million, with zinc comprising the bulk of the remainder.

The Curl's the Thing

WHETHER IT BE movie star Barbara Britton's hair or her karakul fur coat, it is said to be improved by Spray-A-Wave, made by Consolidated Royal Chemical Co. (Chicago), of which the late President Roosevelt's youngest son John, shown explaining the preparation's benefits to the actress, recently became president. The product gives hair more body and holds a better wave and curl; can be sprayed on a fur coat to bring out its natural body and preserve its curl. Young Roosevelt has not always confined himself to products for the glamour set, however; he was associated with a firm specializing in drugs for combating old age.

zinc and manganese types is that they sludge; hence tanks require periodic cleaning. More effective anti-sludging additives are being developed, however, and the number of coatings claimed to be non-sludging is growing. Other improvements in zinc types involve better accelerators and materials to give still more uniform crystals and coatings.

In addition to zinc, iron and manganese coatings for steel and iron, there are specialized solutions for lesser volume metals—zinc, cadmium and aluminum surfaces—as well as phosphoric acid-base types for ferrous metals and aluminum.

Where they Go: Automobiles are the biggest consumers. Behind them are domestic appliances, metal furniture, Venetian blinds—any sheet metal with a baked-on finish. Then there is a wide range of hardware—tools, nuts, bolts, firearms, etc.—which are treated to prevent corrosion.

Motor manufacturers use manganese types on surfaces of parts to combat wear due to friction; and here again, the auto industry is the big buyer. Metal fabrication, where the coatings aid in drawing and other forming operations, including the new cold extrusion of steel, is the other large outlet.

Ask the Man: Everyone knows zinc types now predominate, but few agree on which has the brightest future. Leader in the field is Parker Rust Proof Co., followed closely by American Chemical Paint. That means that these two are top dogs in zinc—although they have products of all types—and it's natural for them to think zinc will stay out in front.

Parker, for its part, insists that zinc is the recognized quality standard, points to Government specs requiring it on such items as shells and rockets to back up its claim.

Probably enjoying the largest volume in the iron phosphate field are Neilson Chemical Co. and Oakite Products. Oakite, in pioneering the new type iron formulations, shows where its heart is. And Neilson sees a rosy outlook for iron because it needs fewer washings, requires less equipment, and can combine cleaning and phosphatizing in one operation.

The big users have some thoughts on the matter too. Ford Motor Co., for example, prefers zinc phosphate for a paint base, reports its tests have proved zinc's superiority in preventing rust creepage from scratches. But it likes iron for its non-sludging feature, thinks there is a good possibility of its moving up as development work improves solutions.

Insecticide Smokes

Thermal generators to dispense lindane, DDT or mixtures of the two, when used with prescribed restrictions, are apparently safe, according to the Interdepartmental Committee on Pest Control. The Committee, which is composed of representatives of the Departments of Agriculture, Interior, and Defense, and the Federal Security Agency, recently stated that there are no data at present to indicate that this method of controlling flying insects is unsafe when the following precautions are taken:

1. Rate of release of the insecticide must not exceed 1 gram per 15,000 cu. ft. per 24 hours.

2. Installation must be made only in commercial or industrial premises, mess halls, and similar locations where human exposure is on a working day basis, and not continuous.

3. These devices should not be used in homes or sleeping quarters.

4. Such devices should be constructed so that output in excess of recommended rate is impossible. Fuses to protect against over-loading and high temperatures, and a pilot light to indicate whether or not the unit is operating should be "built-in" features.

5. Units should be mounted above head height and 3 ft. or more from the ceiling.

6. The device should be so installed that any material which might condense on equipment, walls or ceiling cannot be dislodged and fall into or otherwise contaminate food.

Down to Bare Soil

A new Du Pont non-selective weed killer, CMU*, shows promise of controlling mixed grasses and broad-leaf weeds, will be available in limited amounts for commercial use next year.

Dense growths of grasses and weeds wilt under the effects of the compound, leaving only bare soil. These results were confirmed not only by the company's tests, but by numerous investigators trying CMU under various field conditions during the past year—in such scattered locales as every state in this country, Canada, Hawaii, Alaska, Puerto Rico, Honduras and Colombia.

And they point to potential commercial applications in preventing growth of grass and weeds on railroad roadbeds and trestle locations, around power sub-stations and plant sites. It

* Chemically, 3-(p-chlorophenyl)-1,1-dimethyl urea.

is also likely to find use in lumber yards, petroleum tank farms, arsenals and areas around telephone and telegraph poles, where the fire hazard from dense vegetation is great.

The new product is reported to control many perennial weeds such as Bermuda grass, quack grass, Johnson grass and bindweed; also practically all annual weeds. Further investigations are being carried out to determine how long various CMU-treated soils remain sterile, and to evaluate CMU in controlling weeds in certain agricultural crops, when applied in light dosages at planting time.

Neither corrosive nor flammable, CMU is relatively non-volatile. It has been applied as a spray, using a wettable powder dispersed in water. Laboratory tests indicate that it is nontoxic to warm-blooded animals.

Du Pont's Grasselli Chemicals Department's plant in Cleveland will make the limited amounts to be available in 1952 for commercial use.

First Indictment

Investigations by the Department of Justice into "fair trade" pricing *(CW, Oct. 6)* following the Schwegman Decision have led to the first indictment of drug wholesalers charged with trying circumvent the law as it now stands.

The Federal Grand Jury in Pittsburgh has returned an indictment against the Allegheny County Retail Druggists Association and four wholesalers (Federal Rice Drug Co., Geo. A. Kelly Co., McKesson & Robbins and Shipley Wholesale Drug Co.) charging them with violation of the Sherman Anti-Trust Act by conspiring to maintain retail prices and cooperating in preventing retailers who had not signed contracts with manufacturers under the Pennsylvania Fair Trade Act, from cutting prices of drugs.

This is based on the Schwegman Decision which declared that a retailer without a signed contract is not required to maintain fair trade prices.

The indictment alleges a conspiracy among the defendants and all firms which are members of the association and engaged in selling drugs wholesale or retail. It also names as co-conspirators but not as defendants all members of the association.

In its indictment, the Grand Jury points to the huge size of the conspiring group as follows: In 1950 the wholesaler-defendants did business in the Pittsburgh area totaling $26 million. The retailer-defendants did business totaling $10 million.

SPECIALTIES . . . .

Detergent Switch: Sodium lauryl sulfate, which gained fame as a detergent, has found a new use. The W. S. Merrell Co., Toronto, uses it as an ingredient of pills for peptic ulcer treatment. The lauryl sulfate inhibits the enzyme lysozyme, which has been considered one of the causative agents of ulcers. It is combined with an antacid, demulcent and antispasmodic in the preparation Kolantyl, which Merrell supplies.

•

Specialty for Nylon: A milky lotion designed to improve wearing qualities of nylon hose went on sale this week in Philadelphia. The product, Nylast, distributed by Shaw Products Corp., of Philadelphia, is said to renew the pristine, straight-from-the-mill finish and to make them snag-resistant.

•

Brake Fluid Lubricant: Dow Chemical has begun commercial production of its Polyglycol 15-200, which can be used as a hydraulic brake fluid lubricant and as an intermediate for surface-active agents. Derived from polyalkylene oxides, it is described by Dow as combining the best properties of the polyethylene and polypropylene glycols. Other possible uses —lubricant for metal working and rubber molding.

•

California Expansion: Strong Cobb, Inc., Cleveland, 118-year-old private formula manufacturing drug concern, expects to complete a Los Angeles County plant in February or March, 1952, at the cost of $384,000. In addition to its Cleveland facilities, the company also carries on manufacturing operations at Montreal.

•

Lindane Vaporizer: The De-Bug-Er Co. of Madison, Wis., has introduced a vaporizer for use in insect control indoors. The attachment, De-Fly-Er, has as its active ingredient lindane, the 99% gamma isomer of benzene hexachloride.

•

Phenolic Compound: General Electric's Chemical Division has developed a fast-cure phenolic compound, G-E 12853, which can be used at varied preheating and mold temperatures. Cure time savings cited by the company range from 16% to 40%.

•

Antianemic Capsules: Sharp & Dohme, Inc., Philadelphia, has introduced Redicyte, a high potency antianemic capsule containing B vitamine, liver fractions, vitamin C, iron and folic acid.

PACKAGING . . . .

Korean War Drains Drum Supply

ONE BIG REASON why drums are in such short supply here is the huge quantity needed in Korea to support the armed services. Interior Secretary Chapman estimates that the United Nations shipped 50 million barrels of petroleum products during the first twelve months of the war. U. N. forces in Korea together with U. S. military forces in other places consume 5% of total U. S. production. In view of those figures, it's easy to understand a drum shortage here.

Liner Gains

With its business of coating drums with polyethylene on a commercial basis for a year, Delaware Barrel and Drum Co. (Wilmington, Del.) is looking for new fields to conquer. It has just perfected an on-the-spot method for coating large tanks, is now working on a liner for fiber drums. From early indications, the latter looks "extremely promising," say company officials.

Delaware Barrel and Drum (a drum reconditioner) is not the only firm that lines containers with polyethylene.* However, the company claims that its process is quicker, cheaper and turns out more versatile packages than most.

Original tests by the company showed that for optimum usefulness the lining should be at least six mils thick. The problem boiled down to finding a method that would do the trick with one or two applications; developers also had to lick the problem of adhesion to metal.

With a helping hand from flake producers, Du Pont and Bakelite, the company came up with its present process which gives the drums a ten to fifteen mil lining in two coats.

Two in One: Actually, the finished drum is a container-within-a-container. The interior coating will assume the contour of the outside container if the drum is bent or damaged in transit.

Presently, the drums are used for packaging a raft of chemicals. Among the chemicals that have withstood exhaustive tests: hydrofluoric acid, formic acid, formaldehyde, quaternary ammonium compounds. Like everything else, the drums have their limitations too, and have been found unsatisfactory for certain concentrations of hydrogen peroxide, sulfuric acid, and propionic acid. On that score, though, company officials are quick to point out that the whole process is still in the development stage and early failures are not conclusive.

Current price of the drums in carload quantities is $10.75 for open-head drums, $12.75 for the bung-type. More raw materials, better techniques and more production are expected to cut costs sharply. But even at the present price, President Al Heisler and Vice President Jerry Heisler envision a potential market of 5 to 10 million drums a year. Whether or not its linings for fiber drums live up to expectations, or whether it snares a market for applying linings to big tanks, the company still adds up to a whopping big business.

* American Agile, for example, has found flame-spraying a successful process.

BOOKS.....

Manpower Resources and Utilization, by A. J. Jaffe and Charles D. Stewart. John Wiley & Sons, Inc., New York, N.Y.; xi+532 pp., $6.50.

Although defense preparations and war furor accentuates the problems of manpower resources and utilization, the authors in this volume are attempting to study this country's "normal" working force so as to attain a certain focal point from which abnormal variations can be evaluated. Working from the premise that the working force of a nation is a function of all the aspects of the entire society, the authors review such general considerations as the population theory, economic development and social change. The book is organized into three parts which review the nature of the working force; give a statistical description of this force—both past and present; and finally furnish data to clarify the relationships between the working force and sociological, demographic and technological factors.

Corrosion Guide, by Erich Rabald. The Elsevier Press, Inc., Houston, Tex.; vi+629 pp., $12.50.

Aimed specifically for the practicing chemist or engineer, this volume goes lightly over fundamental considerations, giving only enough theory to permit correct interpretation of data, and emphasizes rather the type of information needed by a technician in actually preventing corrosion. Performance and interaction phenomena data for over 40 construction materials and 250 corrosive agents are set forth in tabular form so as to permit the rapid solution of any particular corrosion problem. A full bibliography covering both books and periodicals appears at the end of the book.

Agricultural Chemistry, Volume II, edited by Donald E. H. Frear. D. Van Nostrand Co., Inc., New York, N.Y.; viii+588 pp., $9.50.

While the first volume of this reference work is concerned with the more fundamental phases of agricultural chemistry, this concluding one deals with the practical applications of the science; and is thus likely to be of greater interest to the practicing agricultural specialist. Written by 23 specialists, the book is divided into five main sections. The first part begins with specific information about the chemistry of the major agricultural products—their chemistry, factors influencing their composition, and changes in their composition during various stages. The last three sections

BOOKS . . .

cover the most important applications of this study—from fertilizers and soil amendments to animal nutrition, pesticides and commercial agricultural chemistry.

Statistical Methods for Chemists, by W. J. Youden. John Wiley & Sons, Inc., New York; x+126 pp., $3. Writing from a laboratory standpoint, the author directs this book to those who "make measurements and interpret experiments"; he presents for the scientist the modern statistical system of units for expressing scientific conclusions. A main point stressed here is that statistics can be used by chemists as a means for making sharper and better predictions; and thus laboratory men can plan and conduct experiments in such a way as to obtain required data with a minimum of effort. Statistical techniques used for the interpretation of data in this way, however, are usually devised to make use of the data as the sole source of information. In discussing his subject, the author utilizes examples based on actual data from real investigations.

MEETINGS . .

Amer. Fair Trade Council, annual meeting, Waldorf-Astoria Hotel, New York, N.Y., November 7-8.

Amer. Drug Mfrs. Assn., Waldorf-Astoria Hotel, New York, N.Y., November 8-9.

Amer. Council of Coml. Labs., Baker Hotel, Dallas, Tex., November 15-16.

Chemical Industries Exposition, Grand Central Palace, New York, N.Y., November 26-December 1.

Chem. Specialties Mfrs. Assn., annual meeting, Mayflower Hotel, Washington, D.C., December 2-4.

Amer. Inst. of Chem. Engrs., annual meeting, Chalfonte-Haddon Hall, Atlantic City, N.J., December 2-5.

Natl. Assn. of Mfrs., annual meeting, Waldorf-Astoria Hotel, New York, N.Y., December 5-7.

Soc. of Cosmetic Chemists, annual meeting, Biltmore Hotel (Ball Room), December 6.

Compressed Air & Gas Inst., The Drake, Chicago, Ill., December 11-12.

PICTURES IN THIS ISSUE:

Cover (bottom)—General Electric Co.; p. 15 (top)—Rapids-Standard Co.; (bottom)—Sherwin Williams Photo; p. 16 (left)—Intl. News Photo; p. 17—Bob Bailey Photo; p. 24—Argonne Natl. Lab.; p. 37—Pennsylvania Salt Mfg. Co.; p. 38—Wide World Photo.

LOCKED IN...

The Safety Package for Hard-to-Control Products . . .

Fulton W.P.P.L. (Waterproof Paper Lined) Bags are made with a tough paper or plastic lining laminated to cotton or burlap. The most finely powdered product cannot sift through this lining, which is also an efficient vapor and moisture barrier.

Fulton W.P.P.L. Bags are designed especially for sensitive products that are affected by evaporation, changing atmospheric conditions, or that need protection against moisture or odors.

Our modern plant in New Orleans is turning out famous Fulton MULTIWALLS in larger and larger quantities. Complete satisfaction and highest praise from industry's largest users, have made Fulton Multiwalls more popular than ever before. Fulton makes the MULTIWALL Bag for your product — all types and sizes.

Over rigid containers they have the advantage of *flexibility* which contributes to easier handling and better utilization of storage space. There are also important savings in initial cost and freight. Address your nearest Fulton branch for further information on this safety package for your product.

Fulton BAG & COTTON MILLS

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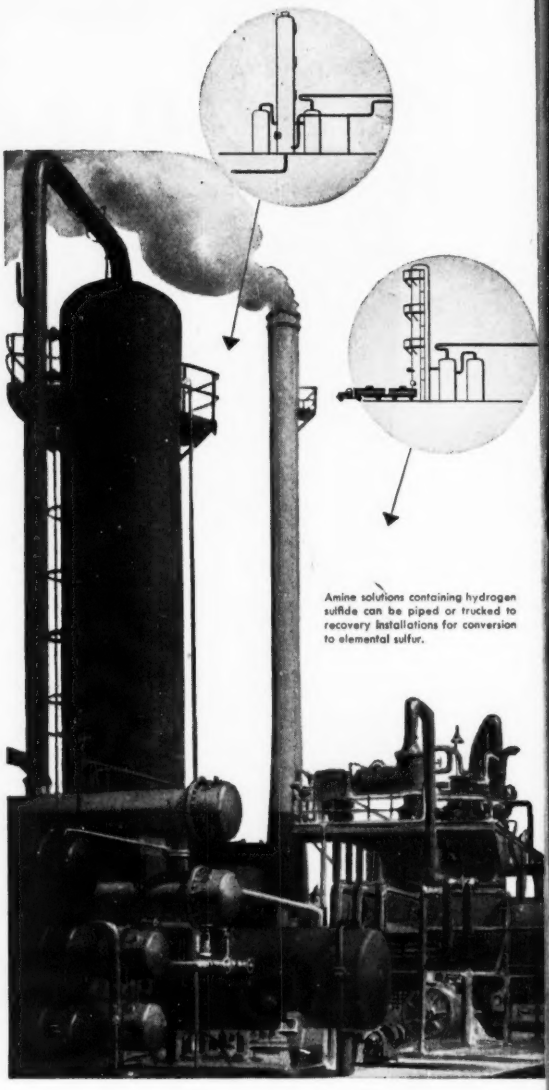
FACTS about ETHANOLAMINES



Amine solutions containing hydrogen sulfide can be piped or trucked to recovery installations for conversion to elemental sulfur.

The unique characteristics of the ethanolamines have led to their large volume use in varied industries. From dry ice to sulfur, from cosmetics to detergents, the mild alkalinity and high water solubilizing power of the ethanolamines are serving both industry and the household. To assist you in realizing full value from these basic materials, Dow offers you the following information:

For example, the ethanolamines can be used to recover hydrogen sulfide which can be converted to elemental sulfur. Also, you can control sulfur fumes with resulting lower maintenance costs from reduced corrosion. And, by preventing atmospheric contamination, your industrial standing in the community will be greatly enhanced. Many other uses can be developed for the ethanolamines in detergents, and cleaning and polishing compounds.

Despite today's shortages, Dow is interested at all times in helping you use the ethanolamines to best advantage in your present operations or in experimental work for future uses. For more information and technical assistance, write Dow using coupon at right.

Properties of Ethanolamines

	Monoethanol-amine	Diethanol-amine	Triethanol-amine
Molecular Weight	61.1	105.1	149.1
Boiling Point (760 mm.Hg), °F.	338.9	516.4	680.0
Freezing Point, °F.	50.0	81.7	87.6
Specific Gravity (77/77°F.)	1.015	1.093*	1.120
Refractive Index (77°F.)	1.453	1.475	1.483
Flash Point, °F.	185	285	—
Fire Point, °F.	190	330	—
Heat of Vaporization, cal./gm.	206.5	128.2	60.1
Heat of Fusion, cal./mole	3915	5351	3200

*at 80/77°F.

Solubility of Ethanolamines (at 77°F.)

	Monoethanol-amine	Diethanol-amine	Triethanol-amine
Acetone	∞	∞	∞
Benzene	sl. sol.	sl. sol.	sl. sol.
Ether	sl. sol.	sl. sol.	sl. sol.
VMP Naphtha	sl. sol.	sl. sol.	sl. sol.
Methanol	∞	∞	∞
Water	∞	∞	∞

This is one of a series of Dow advertisements you may wish to keep on file for reference and information. Write Dow for reprints.

USES OF ETHANOLAMINES

gas treatment

Monoethanolamine is used in removing carbon dioxide and hydrogen sulfide from gas streams. Then, the hydrogen sulfide may be selectively burned to produce sulfur.

When methane is burned to produce carbon monoxide and water in the manufacture of methanol, a certain amount of carbon dioxide is produced. This carbon dioxide, which would interfere with later operations, is removed with monoethanolamine.

Methane is scrubbed with monoethanolamine prior to making carbon black. This scrubbing removes any hydrogen sulfide which would subsequently be converted to sulfur and contaminate the carbon black.

Diethanolamine is used in much the same manner as previously described for monoethanolamine. However, diethanolamine may be used in cracking gases and coal or oil gases which contain carbonyl sulfide that would react with monoethanolamine.

surface active agents

Monoethanolamine and triethanolamine may be reacted with sulfonated alkyls or fatty acids to produce detergents, soaps, shampoos and various cleaning compounds. To this date, the largest single use is in the production of a moderate duty household detergent.

Diethanolamine is used extensively in the production of lubricants for the textile industry. These lubricants can be easily removed by the use of a detergent. Also, diethanolamine is used in detergents, soaps and cleaning compounds.

cleaning and polishing compounds

Triethanolamine is used in the manufacture of cleaners and polishes for metals, wood, leather, floors, and furniture. Triethanolamine soaps act as emulsifiers and dispersing agents in these applications. Triethanolamine is also used in automobile polishing, cleaning and degreasing compounds. It is used in emulsion stabilizers and dispersing agent for waxes and industrial lubricants.

miscellaneous uses

Monoethanolamine is reacted with other chemicals to produce an accelerator which has greatly reduced the time required for producing penicillin. Monoethanolamine is also used in a variety of other products such as wax removal compounds.

Diethanolamine is used as an emulsifier and dispersing agent in various agricultural chemicals, cosmetics and pharmaceuticals.

PRECAUTIONARY MEASURES

The ethanolamines do not present an appreciable fire hazard. Monoethanolamine has the lowest flash point of the three (185°F.) and should not normally present a hazard except in cases of large leaks or spills.

The ethanolamines present no unusual toxicity hazards. Monoethanolamine may cause skin irritation in concentrations greater than 1% and contact should be avoided as much as possible. Diethanolamine is markedly irritating in concentrations greater than 10%. Triethanolamine is not seriously irritating if diluted and will probably cause no serious difficulty unless prolonged or repeated exposures are encountered.

Strict precautions should be observed whenever there is a possibility of eye contamination with an ethanolamine. All persons should wear face shields, goggles with side shields, or the equivalent. Suitable facilities for washing the eyes should be readily available. If contaminated, the eyes should be washed with large amounts of flowing water and medical aid should be summoned.

If an ethanolamine is spilled on the person, all contaminated clothing should be removed and not worn again until decontaminated. The exposed area should be washed with plenty of flowing water and medical aid should be summoned for victims of extensive or prolonged exposure.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

WRITE DOW FOR INFORMATION AND TECHNICAL ASSISTANCE.

The Dow Chemical Company, Dept. OC-39,
Midland, Michigan

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DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

HOW CAN ISCO PRODUCTS WORK FOR YOU?

in the Chemical Industry

WAXES

BEESWAX	JAPAN
CANDELILLA	OURICURY
CARNAUBA	OZOKERITE
CERESINE	PALM

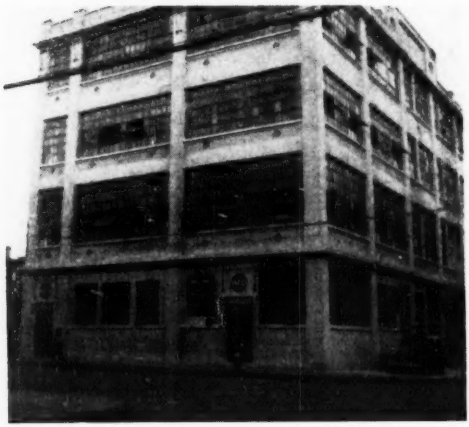
WAX SUBSTITUTES

The above Waxes are imported, refined and specially compounded in our plant assuring the customer of uniform quality.

GUMS

ARABIC	LOCUST BEAN
GHATTI	TRAGACANTH
KARAYA	ISCOLIZED GUMS

These Gums are processed to standards of cleanliness and uniformity to meet the strictest customer specification.



This is a picture of our factory in Jersey City, N.J. where various Waxes and Gums are processed.

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Every step of the way, from selection of raw materials down to the careful control of quality, you will find Innis, Speiden outstanding.

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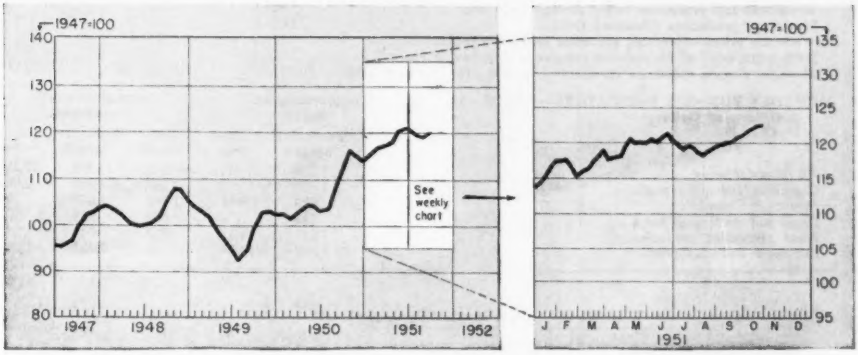

CW Index of Chemical Output—Basis: Total Man-Hours Worked in Selected Chemical Industries

Eyes are on production this week as chemical output measured by the CW index keeps on climbing. The trend has been up ever since the summer low of 118 back in August. Now the index is over 122 (an all-time high) and still shows no signs of abating.

It isn't likely that this rate of increase will continue. More probably chemical output will level off near the current mark. Chemical producers and the chemical process industries can scent a rise in government orders, but would rather not go too far out on a limb.

This record production pace has been reached amid some nettlesome difficulties. These include economic squeezes through price controls and supply squeezes through allocations and material shortages. But step by step, many of the kinks are coming out.

For instance, chlorine and benzene users are much better off, supply-wise. Benzene supplies are practically in balance with demand. Chlorine should be in considerably better position by this time next year.

Chlorinated insecticides, such as BHC and DDT, are plentiful. Many other chlorinated derivatives will be more available by the end of 1952.

At that time chlorine output will be slightly over 9 thousand tons daily, compared to a little better than 7 thousand tons per day by the end of this year.

Sulfur and sulfuric acid supplies are the major exceptions to the buoyant industrial outlook. And not much can be done to bring improvement until well into 1953. But there are some encouraging signs even now.

The National Production Authority is making a real effort to channel sulfur and sulfuric acid into the most essential uses.

The Office of International Trade may see fit to reduce sulfur export quotas if Italian sulfur output continues its recent progress. (100% more than in 1950.)

The Office of Price Stabilization is readying a special price regulation for sulfuric acid that will have widespread effects. OPS will take into account the fact that interruption of production schedules and catch-as-catch-can buying are part and parcel of higher costs.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	123.0	122.7	116.7
Bituminous coal production (daily average, 1000 tons)	1,896.0	1,828.0	1,971.0
Steel ingot production (thousand tons)	2,089.0	2,057.0	1,975.0
Wholesale prices—chemicals and allied products (1926=100)	141.8	141.2	132.3
Stock price index of 14 chemical companies (Standard & Poor's Corp.)	232.4	247.0	195.9
Chemical process industries construction awards (Eng. News-Record)	$10,553,000	$34,030,000	$19,721,000

MONTHLY BUSINESS INDICATORS—TRADE (Millions of Dollars)	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	21,700	21,324	21,413	40,536	39,894	29,253
Chemicals and allied products	1,553	1,535	1,461	2,932	2,850	2,064
Industrial Chemicals	725	680	588	1,116	1,084	780
Drugs and medicines, soaps	332	328	354	830	818	592
Paper and allied products	691	637	615	927	917	645
Petroleum and coal products	2,061	1,912	1,867	2,536	2,481	2,090

More than one sign is on hand that the British Commonwealth is striving for chemical self-sufficiency, less dependence on the United States. One case: Canada expects to turn out another 100,000 tons of sulfur in the coming year from pyrites, refinery gases, and smelting operations.

England is trying not to be outdone in this drive. Convinced that the U.S. can't maintain the sulphur export rate, England will get more sulphuric acid from domestic gypsum, and will improve its own export position by making another 3 million gallons of benzene from coal tar.

In this country, more benzene or benzene substitutes are still being eagerly sought. Supply and demand at this time are in approximate balance, but shortages could develop if demands for styrene, phenol, or nylon should mount. The coal tar benzene from England will undoubtedly find a ready market, for it will be cheaper than the 50-55¢ a gallon figure for benzene-from-petroleum.

Further relief for benzene supplies may be forthcoming from cyclohexane, alternate route to nylon. According to the OPS, nylon manufacture must be expanded to keep up with defense needs. But to recover cyclohexane from gasoline fractions takes a tidy outlay of capital. In a bid for more output OPS now has made it possible for refiners to apply for higher cyclohexane price ceilings.

Chemstrand Corp. will use cyclohexane for its nylon production.

Despite this, the Office of International Trade has eased up on nylon export quotas for the last quarter of 1951. New quota for yarn is 1.2 million pounds, a half-million above the previous quarter. This is not necessarily at variance with the OPS incentive plan. The quota reflects a better current supply; OPS is scanning the future.

Sodium hydrosulfite exports are sure to slacken. The OIT is ready to crack down on transshipments to Iron Curtain countries; expected revival of textiles will raise demand for the bleach. Now of course, the two-week-old dock strike on the Atlantic seaboard has halted not only hydrosulfite but all chemical imports and exports to that area, totalling some $20 million a month.

SELECTED CHEMICAL MARKET CHANGES — Week Ending November 3, 1951

		Change	New Price		Change	New Price
UP	Acetic Acid, 80%, cwt.	$2.00	$12.45	Carnauba Wax, No. 1 Yel.	$ .05	$1.26
DOWN	Nonylphenol, tanks	.005	.325	P-Amino Salicylic Acid	1.05	4.45
	Oxalic Acid, cwt.	.35	16.00	Resorcinol, tech., c. l.	.015	.82

All prices per lb. unless quantity is stated

NAPHTHENATES: Another casualty to the battle's heat.

Naphthenates Up Front

Industry will get less naphthenates in the next year. Reason: Armed forces now take half, slated for three-quarter share.

Chance of output boost is slim: Only a few crudes contain naphthenics, and they are expensive to recover.

Chemical processors will fall back on alternate materials, especially tallates, for paint driers.

Not all petroleum refiners can make naphthenic acids, but almost all naphthenic acid comes from petroleum. And there's the rub. Refiners haven't been able to turn out enough naphthenic to satisfy both military and civilian customers. This week an industry advisory committee comprising the major producers met with the National Production Authority to ponder the problem and how to meet it. Here's what they found: The military will get more, and civilian industry quite a bit less.

To The Front: At this stage of the mobilization program, military needs add up to slightly more than half of the available supply. But the refiner-producers now find that the armed forces' plans for next year call for almost three-fourths of present output.

It is well-known that the Army needs copious amounts of naphthenates in making flame throwers and jelly bombs. Of less tactical importance, but still essential to the Pentagon program, are mildew-proofing agents. Naphthenates are still slated to supply the bulk of these needs, despite rising demand for the scarce hydroxyquinoline salts.

Easily Said: The civilian customers who get the rest of the naphthenate supply may hope for another miracle of petroleum technology. They may expect to get more naphthenates somehow, but the hard facts are different. For one thing, naphthenic acid is found in relatively few crudes in the Western hemisphere, chiefly California and Venezuela. At best, it is found to the extent of around one per cent of the crude, and usually less.

To recover the naphthenic, huge volumes of the kerosene and gas oil fractions have to be processed. It can't be done quickly or without a heavy expenditure.

Even a sizable price boost would hardly justify it. But producers, aware of the urgent requirements, are doing all they reasonably can to step up present output.

They're Next: To get any real improvement in the naphthenate supply will almost surely call for some form of government guarantee against financial loss. Whatever the outcome, civilian industry can't expect an improvement in their share for some time.

Biggest user of naphthenates by far is the paint industry, which uses the

heavy metal salts as driers. To many, these driers are just about ideal. Faced with this famine, paint makers will be depending more heavily on tallates to meet their future needs.

Longer Look: In the long run, as purer tallates become more widely used, it is likely that they will establish a firm foothold in the paint drier business.

Soon: Acetic Austerity

Producers of acetic acid and anhydride, who feared the worst when demands for acetate rayon dropped off, have found that their worries were unfounded. Other users have gobbled up all available supplies.

On the other side of the fence, would-be buyers are contending with expanding demands for almost all acetic-consuming products except textiles. For them, the tight situation of the past months will continue; and supplies will be even more difficult to come by if textile production resurges.

Activity of the textile industry is the basic factor in the market picture on acetic acid and anhydride. This industry is feast or famine: Generally it has a two-year cycle—one year is good, the next bad. According to economists, this is the off-year. These "normal" conditions are aggravated by a singular indifference on the part of merchants who usually would be buying goods, but now are more interested in ridding themselves of scare-bought inventories.

According to proponents of the cyclical theory, it's just about time for the textile industry to perk up. And when it does, acetic buyers will find the material even harder to get.

Go Together: While acetic acid and acetic anhydride are often mentioned in the same breath, they are not

GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
Chief, Procurement Division, Supply Service, Veterans Administration, Washington 25, D.C.:			
Nov. 5	A-28	732 btl	Castor oil
		288 btl	Pine needle oil, Dwarf
		3,300 drm	Soap, medicinal, soft
		204 cn	Petrolatum
Aviation Supply Office, 700 Robbins Ave., Philadelphia, Pa.:			
Nov. 6	B-54175B	36,000 gal	Primer, paint, zinc chromate, one gal. can and five gal. pail, spec. JAN P 735 Amend. 1
Commanding Officer, Armed Services Medical Procurement Agency, 84 Sands St., Brooklyn 1, New York:			
Nov. 5	498B	15,444	Drugs and chemicals
	500B	8,320	Drugs and chemicals
Regional Information Officer, Region 3, General Services Administration, Washington 25, D.C.:			
Nov. 5	3G-3967-R	156 gal	Drier, paint, liquid, type 1, in 1-gal. cans accord. Fed. spec. TT-D-651A and Amend. 1/DO-C-22, NPA reg. 2
		5,000 gal	Paint, oil, int., nonpenetrating flat, ready-mixed, white, 5-gal cans, in accord. Fed. spec. TT-P-47A/DO-C-3, NPA, Reg. 2 applies to 2,805 gal./DO-C-9, NPA Reg. 2 applies to 2,195 gal.
		240 gal	Varnish, cabinet, rubbing, in 1-gallon containers, in accord. Fed. spec. TT-V-86 and Amend. 1/DO 21, NPA Reg. 2

GOVERNMENT AWARDS

Item	Supplier	Location
Headquarters, Sacramento Air Material Area, McClellan Air Force Base, McClellan, Calif.:		
Paint remover	Turco Products, Inc.	Los Angeles, Cal.
New York Quartermaster Procurement Agency, 111 East 16th Street, New York 3, New York:		
Soap, ordinary issue	Colgate-Palmolive-Peet Co.	Jersey City, N.J.
Soap, ordinary issue	Lever Bros. Co	New York, N.Y.
Leather dressing, preservative and mildew preventative	Whittemore-Wright Co., Inc.	Boston, Mass.
Methyl bromide, 150 lb. cylinders	Eston Chemicals, Inc.	Los Angeles, Calif.
Armed Services Medical Procurement Agency, 84 Sands Street, Brooklyn 1, New York:		
Diphenhydramine hydrochloride caps.	Parke, Davis & Co.	Detroit, Mich.
Cement silicate	S.S. White Dental Mfg. Co.	Brooklyn, N.Y.
Mercury	Metalsalts Corp	Hawthorne, N.J.
Sulfadiazine tablets	Strong Cobb & Co., Inc.	Cleveland, Ohio
Procaine Penicillin crystalline in oil	J. T. Baker Chemical Co.	Philadelphia, Pa.
Aviation Supply Office, 700 Robbins Ave., Philadelphia 11, Pa.:		
Oil, linseed	National Lead Co.	Philadephia, Pa.
Alcohol	Commercial Solvents Corp.	New York, N.Y.

technically interchangeable. They are, however, definitely interrelated.

In production of cellulose acetate, whether for rayon or plastic, acetylation of cellulose is accomplished with a combination of glacial acid and anhydride. To produce one pound of cellulose acetate (acetate basis), approximately 1.7 lbs. of anhydride and 2.5 lbs. of glacial acid are needed.

A by-product of the reaction is 3.5 lbs. (100% basis) of dilute acid. Better than one million tons (100%) of this acid was recovered in 1950.

The dilute acid is then concentrated, 2.5 lbs. of it goes back to the acetylation, the other pound is added to a pound of virgin acid to make up the 1.7 lbs. of anhydride which goes back to the acetylation. In short, one pound of new acid produces one pound of cellulose acetate (acetate basis).

While the major consumer of acetic is acetate rayon or plastic, there are other fairly sizable uses: Aspirin (acetylated salicylic acid) is one of these; another is plastics, such as vinyl acetate polymers. Expansion in this resin has been one of the major outlets for the acetic slack which rayon producers couldn't take up.

Production and Supply: Production of new acid during 1950 totaled over 225,000 tons—up 18% from 1949's 190,000 tons. Add to this the half of anhydride which wasn't recycled and the magnitude of the picture is apparent.

Acetic acid is also a by-product of destructive wood distillation; it is an economic source only because of the demand for charcoal. But by far the biggest source is synthetic acid (as a product of such reactions as the oxidation of acetaldehyde).

Anhydride is also made by oxidation of acetaldehyde, by dehydration of the acid, by addition of acetic acid to acetylene (by-product: acetaldehyde), and from a process involving ketene. The latter process—the most common one—got its start with the availability of cheap acetone. Acetone is demethanated to ketene, acetic acid is added to give the anhydride.

Upping Capacity: Two plants are now a-building to add to present capacity. Major one is Celanese Corp.'s Pampas, Tex., facilities. Hercules also is constructing additional capacity for captive use. Production here, however, won't measurably increase overall U.S. supplies, since Shawinigan, in Canada, one of the company's present sources, won't be exporting after the middle of 1952. Reason: mounting Canadian demands.

In addition to Celanese and Hercules, Du Pont, Carbide and Carbon, and Tennessee Eastman figure as prominent producers. Of these, only Carbide and Carbon is not a producer of cellulose acetate as fiber or plastic; conversely, American Viscose is the only acetate producer which does not produce any anhydride or new acid.

Up-and-Coming: There is little doubt that acetic producers have their hands full. As one sales manager says, "I could sell a million pounds with one phone call."

To present demand for acetic, the government will be adding some of its own urgent claims. For instance, the Holston Ordnance Works is slated to make hexamine nitrate soon. Bidding for the necessary acetic anhydride is now under way. Government needs plus revived textile demand could make the current acetic supply look plentiful by comparison.

BOOKLETS . . . . .

Chemicals

Refrigerant

Booklet on "Kulene-131," a new refrigerant, with a boiling point of −73.6 F, specially intended for low-temperature applications in the refrigeration field. Eston Chemicals, Inc.

Adhesives

Folder reviewing and briefly describing its line of adhesives, cements, lacquers, thinners, retarders, etc. along with a table serving as an index to adhesive problems and their solutions. Slomons Laboratories, Inc.

Phosphatizing Compound

8-p. booklet devoted to "Anchorite 100," a phosphatizing compound that changes the surface of steel, iron, zinc and cadmium parts into an inert phosphate coating, which prevents corrosion; the booklet describes common causes of paint failure, ways of preventing such failures, and methods of applying the product by means of immersion or spraying. Octagon Process, Inc.

Equipment

Belt Conveyor Carriers

20-p. catalog illustrating and describing the firm's line of belt conveyor carriers with reference to their construction, design, specifications, and particular applications. Stephens-Adamson Mfg. Co.

Controllers

14-p. catalog covering controllers, control

(Continued on page 56)

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • **OPPORTUNITIES** • EQUIPMENT—USED or RESALE

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C. W.

NEW ADVERTISEMENTS received by 10 A.M. November 7th at the New York Office, 330 W. 42nd St., New York 18, N. Y., will appear in the November 17th issue subject to limitations of space available

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REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION VACANT

FRICTION MATERIALS Chemist or engineer, also press room foreman or superintendent. Must have experience on thermo-setting resin clutch facings and brake lining. Write full experience and salary desired. Standco Brake Lining Company, 2701-2801 Clinton Drive, Houston, Texas, P.O. box 93.

SELLING OPPORTUNITY OFFERED

WANTED: MANUFACTURERS Representatives to sell Polyethylene Drum Liners. Exclusive territory—liberal commissions. Write: Better Bags Inc., 840 N. 6th St., Philadelphia 23, Pa.

POSITION WANTED

CHEMICAL ENGINEER: 32, desires position as Administrative assistant or plant supervisor. Nine years diversified experience. PW-2318, Chemical Week.

READER SERVICE

HOW TO USE COUPON

Circle page numbers of items about which you want more details. Then write your name and address on the coupon at the bottom of the page and mail it to us. Your request will be forwarded to companies concerned, the answer coming direct to you.

MAKES IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

THE NUMBERS

Advertisements:—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R, T, B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

Editorial Items:—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

EDITORIAL ITEMS

For more data, circle number on coupon.

NEW PRODUCTS

Polyamide Resins 26A

NEW EQUIPMENT

Bolt Sealer 32B
Controller 32C
Cylindrical Carboy 32D
Electrostatic Precipitator 32A
Flexible Fluorinator 30B
Leak Detector 30A
Leak-Proof Valve 32E

TECHNICAL LITERATURE

CHEMICALS

Adhesives 53B
Phosphatizing Compound 53C
Refrigerant 53A

EQUIPMENT

Asbestos Fabric Packings 56E
Belt Conveyor Carriers 53D
Bulk Sterilizers 56D
Controllers 53E
Drum Cleaning 56F
Duck and Rubber Packings 56L
Industrial Equipment 56K
Insulation Strapping 56M
Load Cells 56G
Organic Coatings 56H
Processing Equipment and Blowers 56O
Pyrometer Supplies 56C
Silicone Rubber O-Rings 56B
Strapping 56N
Telemeters 56A
Turbine Pumps 56J
Weatherproof Asphalt 56I

PRODUCTS ADVERTISED

For more data, circle number on coupon

Aprons, vinyl B38d
Chemicals
- Allethrin 57a
- Anti-skinning agents
  - Guaiacol 58b
  - Lignocol 58a
- Armofos (tripoly) 35e
- Aromatic 51
- Berez 4e
- Bicarbonate of soda T44a
- Carbonate of potash 9b
- Catalysts, synthetic fluid cracking 10-11b
- Caustic potash ..... Ib, 9a
- Chromium 6
- Citric acid anhydrous 22
- Coal-tar 27
- Defoamers, antifoam A 24
- Diethylene glycol 31
- Di(2-ethylhexyl)amine 28d
- Diisopropyl amine 28b
- Disodium phosphate 35d
- Emulsifiers B41c
- Ester gums 4c
- Ethanolamines 46-47
- 2-Ethylhexyl amine 28c
- Fatty acids, soya bean 36
- Gilsonite 34a
- Gloss oils 4f
- Industrial 1a, 3a
- Isopropyl amine 28a
- Lithium compounds B32
- Maleic modified esters 4g
- Metallic stearates 25
- Mineral salts
  - Copper carbonate 2d
  - Copper sulphate 2a
  - Ferric iron sulphate 2e
  - Manganese sulphate 2c
  - Zinc sulphate 2b
- Monoesters 18b
- Monoglycerides, fatty acid 18a
- Monohydrate of soda T44b
- Monosodium phosphate 35b
- Odor neutralizers 30b
- Oxygenated solvents & chemicals 21
- Pentaerythritol T41
- Perfumes 30a
- Pitch compounds 34b
- Plasticizers B41a
- Plasticizer 50 ..... T40
- Potassium bichromate 12c
- Pyrethrum 57b
- Resin finish, superset 10-11a
- Resins, coumarine-indene B40
- Rosins
  - Limed 4b
  - Pale wood 4d
- Sal soda T44c
- Soda ash, natural Ic
- Sodium acid pyrophosphate 35g
- Sodium bichromate 12a
- Sodium chromate 12b
- Sodium sulphate 12d
- Softeners B41b
- Sulfur dioxide 39
- Tetrasodium pyrophosphate 35a
- Trisodium phosphate 35f
- Trisodium phosphate, anhydrous 35c
- Turpentine, wood, steam distilled 4a

Containers
- Bags
  - Polyethylene B38b
  - Water proof paper lined 45
- Can, screw-top for liquids 33
- Covers, transparent, drum or barrel B38c
- Filter media, metallic cloth 28
- Gums and waxes 48
- Instruments, spectrometers 5
- Label pasters T32
- Laboratory apparatus, chemical 3b
- Liners
  - Drum, polyethylene 42
  - Polyethylene B38a
- Materials of construction, ferro-alloy 1b
- Waxes
  - Beeswax, synthetic T38
  - Ozokerite & ceresine 34c

SEARCHLIGHT SECTION

(Classified Advertising)

READER SERVICE COUPON

Mail to Chemical Week, 330 W. 42nd St., N. Y. 18, N. Y.

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

Editorial Items

26A	32B	53A	53E	56D	56H	56L
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Expires February 3, 1952

stations and derivative units. Here is factual information on their advantages, operating principles, interchangeability, operation and maintenance factors, and typical installations, in addition to detailed construction diagrams and a tabular presentation of design and performance data. Moore Products Co.

Telemeters

8-p. bulletin illustrating and explaining the features of the "Chronoflo" telemeter, a device making possible the transmission of information and controls over a two-wire electrical circuit for unlimited distances. In addition to discussing the operation of the transmitter and receiver, the booklet contains diagrams to show the mechanism and installations. Builders-Providence, Inc.

Silicone Rubber O-Rings

Technical data sheet listing specifications and dimensions of silicone rubber O-rings which provide hydraulic seals, resistant to petroleum oils and most hydrocarbons. Frederick S. Bacon Laboratories.

Pyrometer Supplies

40-p. catalog supplying technical data on the application and use of thermocouple pyrometric supplies. Covered, along with the entire line, are standard thermocouple assemblies including base metal elements and Noble metal elements of all gauges. Minneapolis-Honeywell Regulator Co.

Bulk Sterilizers

16-p. catalog giving information on the design and construction features of the firm's line of bulk sterilizers which make use of sterilizing techniques employing a gas consisting of 10% ethylene and 90% carbon dioxide for certain applications where steam alone exerts a destructive effect; these units find application in packaged dry goods, pharmaceuticals, food processing, surgical supplies, etc. American Sterilizer Co.

Asbestos Fabric Packings

4-p. bulletin dealing with asbestos fabric packings, gives service recommendations, available sizes, standard packages, and packaging specifications for high pressure rubber back, high pressure rubber core and high pressure dual edge packings. Raybestos-Manhattan, Inc.

Drum Cleaning

6-p. brochure featuring two models of drum cleaning machines—with capacities of 70 drums per hour and 140 drums per hour—and discussing the "Rotoblast" technique which cleans by throwing metallic abrasives against drum surfaces by centrifugal force. Pangborn Corp.

Load Cells

*Engineering data folders discussing the application of torsion bar load cells and cantilever beam load cells—cells which measure force in tension or compression, thrust, torque, weighing, etc. by changing a mechanical force into a linear electrical signal to be fed into servo recorders and indicators. Automatic Temperature Control Co., Inc.

*Request must be made to company on business letterhead.

Organic Coatings

Bulletin discussing pigmented organic coatings for preventing corrosion, lists typical applications and explains their application by brush, spray, or dip—air-dried or baked. Permolite, Inc.

Weatherproof Asphalt

4-p. folder containing specifications, application data, and approximate costs of "Laykold Fibrecoat," a mineral-armored asphalt intended for the protection of bituminous and metal surfaces, by industry and the Armed Forces; data is also given on the necessary equipment for applying the product. American Bitumals & Asphalt Co.

Turbine Pumps

8-p. bulletin covering both oil- and water-lubricated turbine pumps designed for a variety of uses in agricultural, industrial and municipal applications for a primary water supply from wells, lakes, etc., circulating and dewatering, condenser, sump pumping. Large diagram explains construction features of oil-lubricated type pump. Johnston Pump Co.

Industrial Equipment

40-p. illustrated catalog listing research high-vacuum equipment, high-vacuum pumps and oils, gauges, and glass-working machinery—including a line of hand fires, torches, blast burners, and miscellaneous supplies for glass blowing. Research Vacuum Supply Co.

Duck and Rubber Packings

8-p. bulletin giving service recommendations, standard sizes and packaging specifications of various types of duck and rubber packings. Raybestos-Manhattan.

Insulation Strapping

4-p. bulletin describing the "Expand-R-Strap," a corregated steel strap used to hold insulation in place around tanks, drums, pipe and other equipment which expand and contract in circumference. A. J. Gerrard & Co.

Strapping

6-p. folder covering strapping, seals, tensioners, sealers and accessories used for banding all types of packages, bales, boxes, bundles and pellets. Allegheny Steel Band Co.

Processing Equipment and Blowers

12-p. catalog covering material handling equipment, dustless weigh hoppers for automatic weighing of powdered and granular substances, axial-flow positive-pressure blowers for handling gas or air under pressure or vacuum, double arm mixers for atmospheric, reduced or elevated pressures, and vertical mixers. Read Standard Corp.

ADVERTISER'S INDEX

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St. Louis 8 .... 3615 Olive St., Continental Bldg.

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As pioneers in the processing of M.G.K. Pyrethrum, and M.G.K. Allethrin too, we have developed highly efficient, complete, aerosol mixes and spray concentrates. We also offer partially processed formulations . . . production shortcuts to lower costs. For those who prefer to buy our pure basic ingredients we offer M.G.K. tested formulas and production methods to save you money. For information write M.G.K., 1715 Southeast Fifth Street, Minneapolis, Minn.

Scarabaeus sacer Sacred beetle of ancient Egypt. Model for carved stone amulets and scarabs.

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Parahydroxybenzoates • Penicillin • Pentaerythritols • Propyl Gallate
Resorcinol • Salicylates • Salicylic Acid • Streptomycin